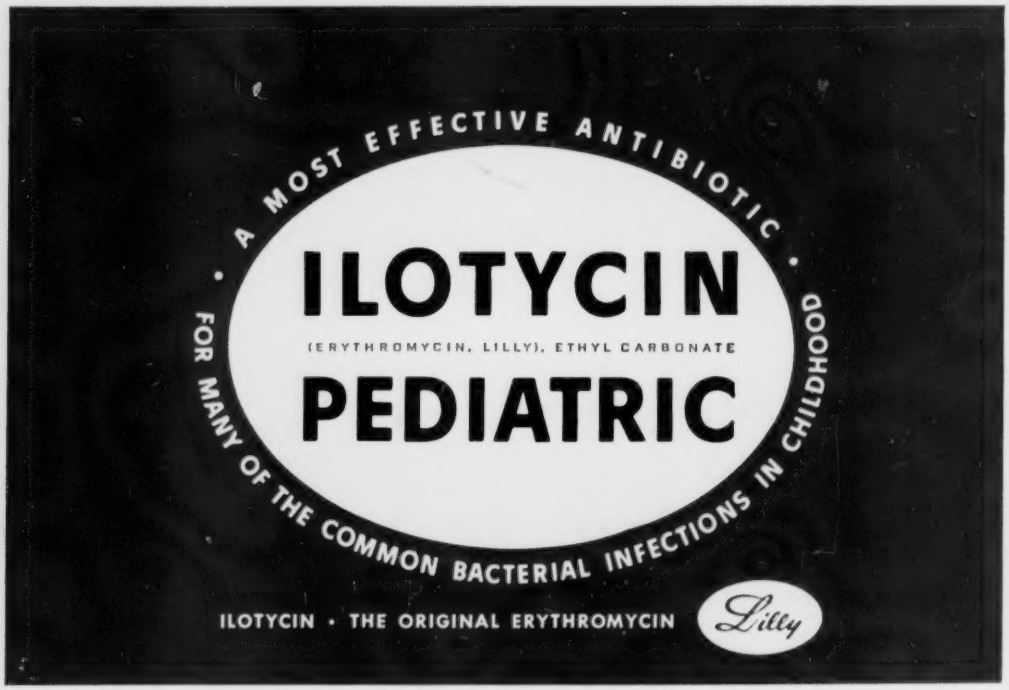
# NORTH CAROLINA

# Medical Journal

Vol. 15 No. 2
February, 1954

CENTENNIAL MEETING, STATE MEDICAL SOCIETY—MAY 3, 4, 5

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VOLUME 15
NUMBER 2

FEBRUARY, 1954

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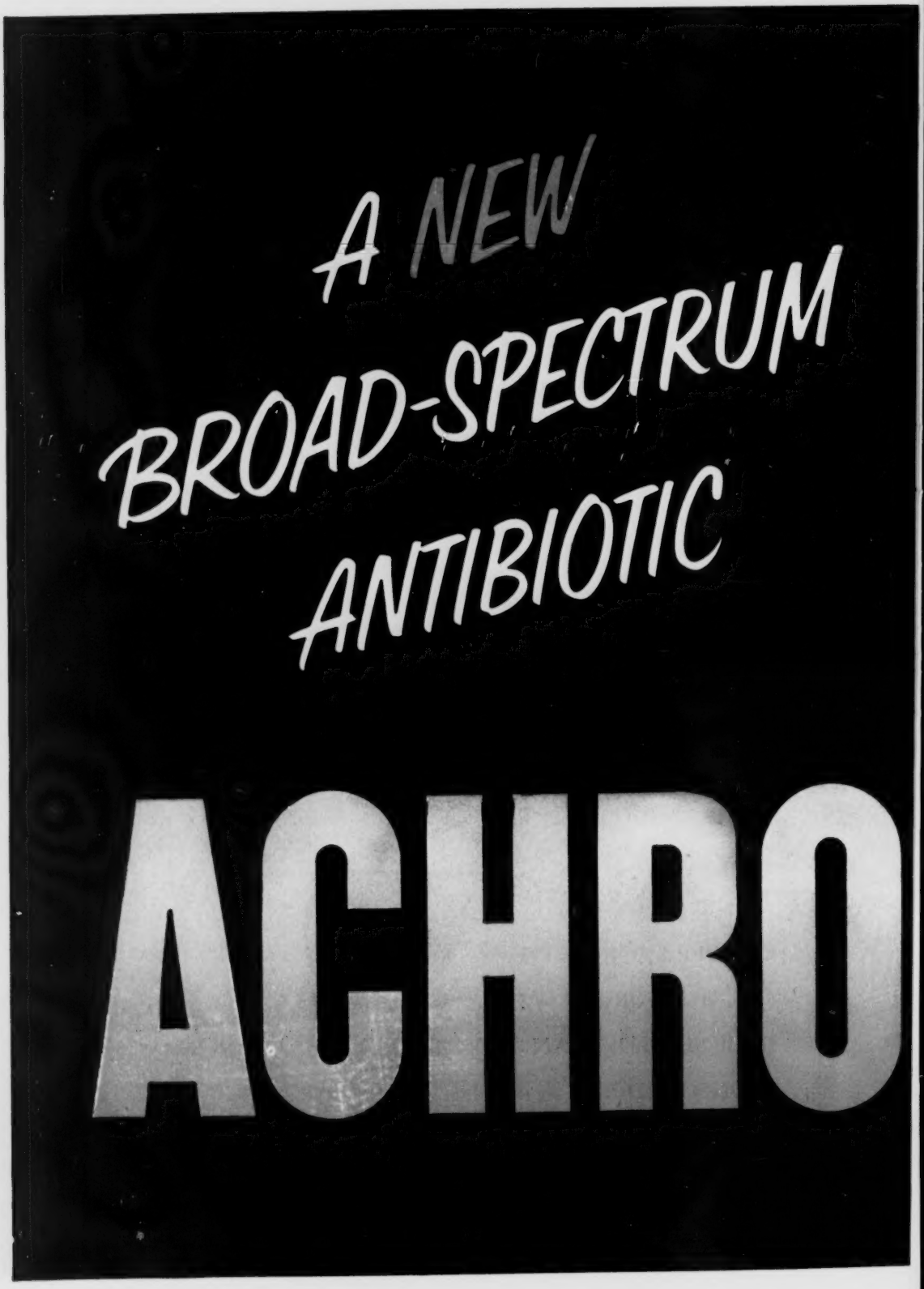
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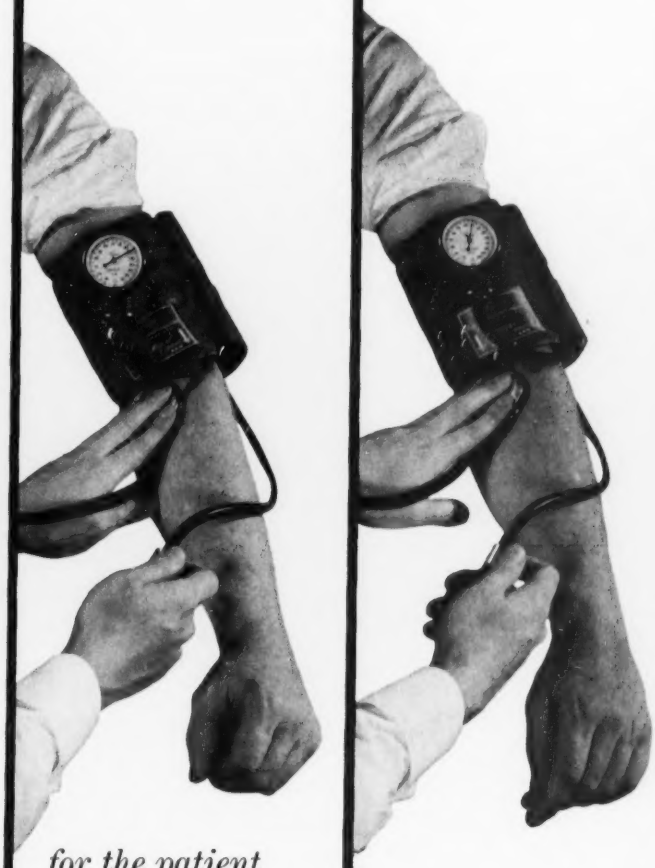

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1. Hafkenschiel, J. H., and Lindauer, M. A.: Circulation 7: 52, 1953.
2. Schroeder, H. A.: Circulation 5: 28, 1952.
3. Riven, S. S., Pocock, D. G., Kory, R. C., Roehm, D. C., Anderson R. S., and Meneely, G. R.: Am. J. Med. 14: 160, 1953.
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1. Dill, J. L.: Postgrad. Med. 4:413, 1948.

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1. Hild, A. M.: Schweiz. med. Wchnschr., 71:557, 1941.
2. New and Nonofficial Remedies, J. B. Lippincott Co., Philadelphia, 1953, p. 200.

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1. Sayer, R. J., et al.: Am. J. M. Sc. *221*:256 (Mar.) 1951.
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5. Potterfield, T. O., et al.: J. Philadelphia Gen. Hosp. *2*:6 (Jan.) 1951.
6. King, E. Q., et al.: J. A. M. A. *143*:1 (May 6) 1950.


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1. Grigsby, M. E., et al., Antibiot. & Chemother., 10:1029, October, 1953.

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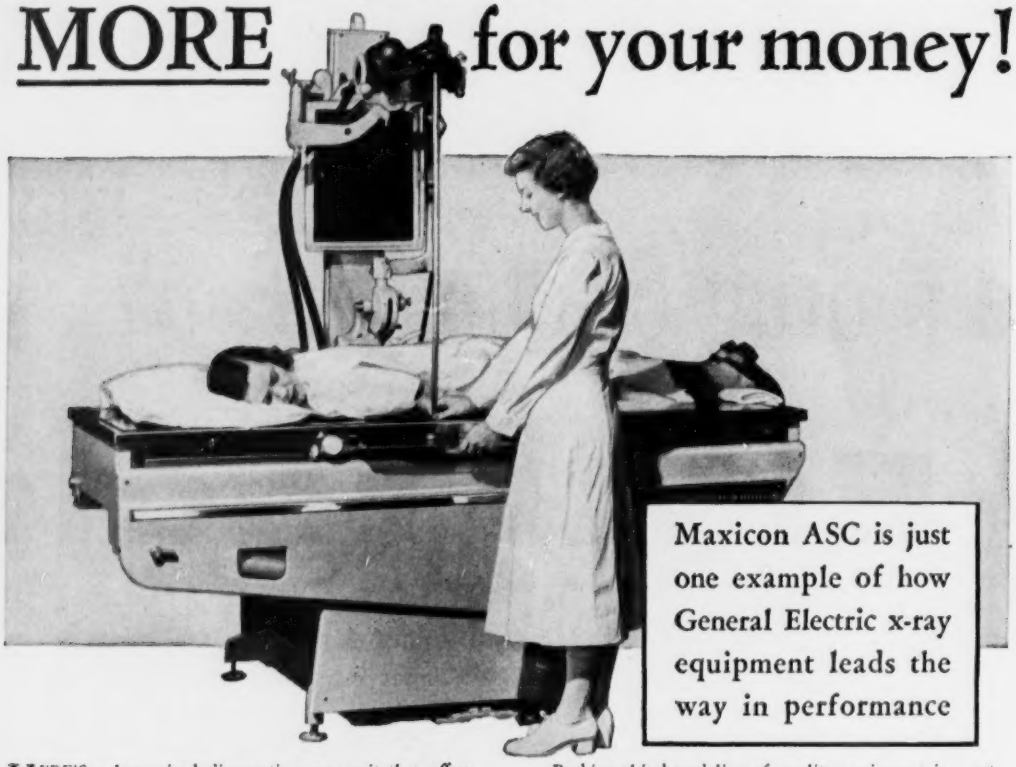

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NORTH CAROLINA MEDICAL JOURNAL

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VOLUME 15 FEBRUARY, 1954 NUMBER 2

# THE CHALLENGE OF INTRAVASCULAR CLOTTING

C. GLENN SAWYER, M.D.
WINSTON-SALEM
*and*
FRANK M. ROBERTS, M.D.
WASHINGTON, D. C.

During the past few years notable progress has been made in the field of intravascular clotting. It is the purpose of this paper to review current concepts and to consider in detail the clinical problem.

*Theoretical Considerations*

Although the problem of intravascular clotting has perplexed medical men through the ages, the precise sequence of events occurring in the process is still not known. For the purpose of this discussion, present knowledge may be considered under two broad headings: (1) the role of various physical factors as initiators of the clotting process, and (2) the clotting mechanism itself.

*Physical factors*

Various physical factors favor the maintenance of the blood elements in suspension. Alterations in one or more of these factors may serve to initiate the clotting process. One of the more important factors is the rate of blood flow. Knisely[1] has pointed out that sludging occurs in the presence of decreased blood flow, that it is always present prior to actual clotting, and that it is frequently present without clinical evidence of clotting. The phenomenon of axial flow, in which the larger blood elements are held in the center of the stream, with a layer of plasma adjacent to the intimal surface, is a direct function of the rate of flow; as a result of decreased flow the larger blood elements no longer maintain their centripetal position and the likelihood of "settling out" or sludging increases. Using the microcinematographic technique, Wright[2] has shown that the likelihood of clot propagation from a smaller to a larger channel is inversely related to the speed of flow in the larger vessel. When the rate of flow is adequate, a platelet or fibrin clump can be sheared off or the clotting cycle may be interrupted by rapidly washing away the highly active serum expressed from fibrin retraction[3].

Although the importance of the rate of blood flow is unquestioned, an alteration in the intima is the *most important* factor in initiating true thrombus formation. This alteration may be either physical or chemical, and may result from trauma, infection, inadequate nutrition, or a toxic substance. Prior to intimal damage both the surface charge of individual particles in the blood and the surface charge of the intima of the vessel are negative. These like charges decrease the likelihood of agglutination, as the particles are attracted neither to each other nor to the intimal surface. With intimal damage, reduction of the repulsion between intima and blood elements occurs.

Under physiologic circumstances, an important characteristic of the intimal surface is that it is "non-wettable." With damage it is "wettable"; a spreading effect is exerted on the platelets coming in contact with the damaged area, and lysis, with release of their active component, results. The clotting mechanism is thus activated.

The stability of the suspension of the blood elements is also important. During condi-

Read before the Section on the Practice of Medicine, Medical Society of the State of North Carolina, Pinehurst, May 13, 1953.

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tions predisposing to thrombosis an increased agglutinability of blood cells has been observed[1]. This change is believed to be due to (1) a loss of outer cell membrane exposing a new surface and potential, (2) deposition of a new coat (fibrinogen), or (3) an upset of electrical potential of the cell wall. Other investigators, however, attribute it to an increase in the hydrophilic colloids such as fibrinogen and globulin[2]. These substances reduce the suspension stability of blood elements by reducing the surface charges and by modifying the position of absorbed water, so as to decrease the surface tension of the elements and render them more attractive to one another.

In essence, then, there appears to be a balance of physical forces operating to maintain blood elements in suspension. Among these factors are the rate of flow, intimal integrity, the repulsion of like surface charges, and the "non-wettability" of cell and endothelial surfaces. A change in one or more of these physical factors renders the suspension less stable, enhancing or precipitating the beginning of clotting.

*The clotting mechanism*

The coagulation mechanism remains under extensive study, and the work of Stefanini, Tocantins, Seegars, Quick, Owren, and others has been noteworthy. Although many points are still highly debatable, there is agreement as to the basic relationships depicted in figure 1.

The normal mechanism of clotting may be visualized as a three-step process: (1) the activation of thromboplastin, (2) the conversion of prothrombin to thrombin, and (3) the formation of fibrin. Most investigators agree that the agglutination and lysis of platelets is the first step in the process. This initiates the activation of thromboplastinogen by releasing a thromboplastic factor. Thromboplastin does not exist as such in the plasma, but is present in an inert form, thromboplastinogen or the anti-hemophilic globulin[4]. The reaction of the thromboplastic factor with thromboplastinogen results in active thromboplastin. In blood, approximately one-half the prothrombin exists in an active state and the other half in an inactive or precursor form[5]. This inactive precursor, prothrombinogen, is converted to active prothrombin by foreign surfaces other than platelets or calcium. Thromboplastin, prothrombin, and calcium interact to produce thrombin. Calcium takes part in all phases of coagulation, but plays its major role in the conversion of prothrombin to thrombin.

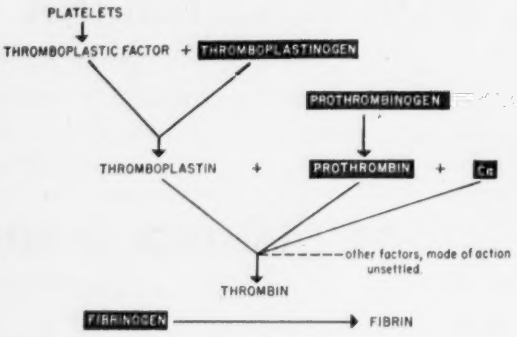


**Fig. 1. Coagulation mechanism.**

All authors agree that for the optimal conversion of prothrombin to thrombin, one or two factors in addition to thromboplastin and calcium are necessary. The origin and mode of action of these additional factors are controversial. Fibrin is produced from fibrinogen by the enzymatic action of thrombin. Fibrin is not an inert product of blood coagulation[6]. It both inhibits and favors continuation of the clotting mechanism. On the one hand it absorbs thrombin on its surface, thereby inactivating this enzyme; on the other hand the fibrin clot, acting as a foreign surface, causes the disintegration of platelets and release of their thromboplastic factor, thus establishing an autocatalytic cycle. Physiologic anticoagulants play an important role in regulating the speed and completeness of this reaction[7].

To attempt to go beyond the preceding generalities on the coagulation mechanism is to enter a highly controversial field. Only a few of the complex relationships between the many factors involved will be discussed. Much of the controversy centers in the nature of the reactions, whether they are stoichiometric or enzymatic. The interaction of the platelet thromboplastic and plasma thromboplastinogen factors has been interpreted as an enzymatic action of the platelet thromboplastic factor on thromboplastinogen[8]. Another view is that the plasma factor lyses the platelets, releasing the active thromboplastin[9]. Recent work, however, suggests that the platelet thromboplastic factor and the plasma thromboplastinogen together, but not separately, constitute

thromboplastin, indicating a stoichiometric reaction[10].

Another point of debate is the origin and mode of action of various factors active in the conversion of prothrombin to thrombin. Again, the different interpretations revolve around whether the reactions are enzymatic or stoichiometric. Quick[8b] stated that thromboplastin, prothrombin, calcium, and a labile component — plasma accelerator globulin—react stoichiometrically to produce thrombin. Most writers[11] are of the opinion that the plasma accelerator globulin and perhaps other plasma and platelet factors behave in an enzymatic fashion in the interaction of thromboplastin, calcium, and prothrombin to produce thrombin. The present consensus is that this enzymatic reaction also embodies certain autocatalytic features.

According to Stefanini[7], this autocatalytic cycle may be considered in two phases. The first is a slow phase consisting of the reaction of prothrombin, thromboplastin, calcium, and plasma accelerator globulin to form a small amount of thrombin. Once a small amount of thrombin is present, it activates the plasma accelerator globulin to serum accelerator globulin. The latter now reacts with prothrombin, thromboplastin, and calcium to produce thrombin at an increasingly rapid pace. The first phase may be looked upon as a reaction utilizing a "weak" enzyme to produce a "strong" enzyme which greatly accelerates that same reaction. Once enough thrombin has been produced, it promptly converts fibrinogen to fibrin. It is fairly well agreed that thrombin in addition to fibrin also produces clumping and lysis of platelets at its site of formation, releasing more platelet thromboplastic factors and enhancing the chain reaction or autocatalytic feature of the coagulation process. Fibrinogen, under the enzymatic action of thrombin, polymerizes to form a network structure, fibrin gel[12]. Lyons[13] regarded this as occurring in two steps: the S-H groups of fibrinogen are freed (fibrinogen B) and then oxidized. More recent work[12], however, has revealed no chemical difference between fibrinogen and fibrin, the only detectable difference being a slight change in the iso-electric points of the two substances.

Usually two physiologic anticoagulants are discussed—antithromboplastin and antithrombin. The former's existence is doubted by some workers. Antithrombin, however, is present in the albumin fraction of plasma and probably acts by adsorbing thrombin on its surface[7]. Another generally accepted factor is a vasoconstrictor substance released from lysed platelets. This substance causes a prolonged, generalized vasoconstriction, thus reducing blood loss and blood flow. Reduction in flow promotes firm anchoring of the fibrin clot. Another feature of intact platelets is their ability to produce clot retraction. The relation of platelet function to clot retraction is not well understood, but there is a correlation between the platelet count and the ability of a clot to retract. A good clot retraction indicates a platelet count of 100,000 or more. During clot retraction the thrombin adsorbed on the fibrin strands is squeezed out, making it available to propagate the clot.

### *Incidence*

Venous thromboses are far more common than is generally realized. They occur in 1 per cent of general hospital admissions[14], 0.5 per cent to 1.6 per cent of postoperative patients[15], and in 0.3 per cent to 2.1 per cent of medical patients[15a,b,4]. Autopsy studies emphasize that the occurrence of venous thromboses is far greater than is suspected clinically. McLachlin[16], in an unselected autopsy series, found the incidence of grossly demonstrable venous thromboses in the legs to be 34 per cent. Hunter[17] found that 50 per cent of all patients confined to bed for a prolonged period have thromboses of the deep veins of the leg.

### *Etiologic Factors and Pathogenesis*

Clinically, numerous conditions have established themselves as predisposing factors. Age apparently plays a role, for 80 per cent of venous thromboses occur in those over 40 years of age, and 60 per cent in the group over 50[14]. Thromboembolism occurs more frequently in men than in women, and fatal pulmonary embolism is two times more frequent in men. Peripheral thromboses, however, are more common in women, due to the high postpuerperal incidence. The incidence is twice as great in those weighing more than 200 pounds as it is in those weighing less[18].

Effort or strain may cause thrombosis in an active, healthy person by sudden violent, or repeated muscular action contusing the vein wall, damaging the vaso-vasorum or

rupturing small contributaries at their origin[19]. Numerous other factors or conditions which increase the tendency to thrombosis have been noted. Among these are infection, trauma, venous stasis, dehydration, hypoproteinemia, hyperglobulinemia, elevated platelet count, carcinoma, and heart disease. An elevated prothrombin level alone is not correlated with an increased tendency towards thrombosis[20].

Recently Marvel[21] has suggested that too rapid diuresis of patients with mercurial diuretics in congestive heart failure leads to hemoconcentration and may be a precipitating cause of thrombosis[22]. ACTH and cortisone have been reported to increase the coagulability of the blood and enhance thrombosis[23]. In experimental work, Nelson[24] showed that these drugs reduced the coagulation time one fourth of the previous value within four hours after administration, and concluded that these drugs increased the incidence of thrombosis. The hypercoagulability effect of ACTH and cortisone has not been accepted by all[25].

Repeated references are made in the literature, particularly by clinicians, to the differences between the clotting in phlebothrombosis and thrombophlebitis, or the white and red clot. Most pathologists do not recognize these as separate entities[16]. The white head or platelet portion is attached to the vessel wall and the red coagulum is unattached to the vessel wall for 24 to 48 hours. After this period the clot attaches itself along its entire length to the vessel wall, producing the histologic picture of thrombophlebitis[14]. The inflammatory element varies, but nevertheless is present in all intravascular clotting. There is no difference in their embolic potentialities[16].

### *Diagnosis*

When one considers that some of the best clinics in this country have reported that in 50 to 89 per cent of patients dying from pulmonary embolism there was no previous evidence of thrombosis[26], it is obvious that criteria in the past have not been adequate for the diagnosis of early thrombus formation. Jorpes[27] adequately stated the problem when he said: "The fate of the patient depends on an early diagnosis while the thrombus is still limited to the calf. Not the least important is attention to the first signs of thrombosis in order to reduce the number of sudden, fatal pulmonary emboli.

It is generally agreed that most of the thrombi begin in the vessels of the lower extremities, the veins of the plantar, malleolar, and calf regions being involved first[14]. With careful examination one may detect early in the process tenderness of the lateral side of the foot, followed by tenderness over the medial malleolus, and later by tenderness over the posterior calf. Still later in the sequence of events there is pain on dorsiflexion of the foot and the calf becomes fuller. Frank edema is rare in the early stage.

A helpful sign, if present, is dilatation of the small veins over the tibia. It is stated that this occurs in 80 per cent of patients with abnormal clotting[14]. The patient may complain of cramping pain, aching, or tightness in the calf. At this stage the temperature, pulse rate, leucocyte count, and erythrocytic sedimentation rate are usually normal in the absence of any other condition which would alter them. One must remember that the classic findings of an increase in calf size and pain in the calf on dorsiflexion do not aid in *early diagnosis*, but instead indicate that there has been extension of the clot into larger channels[28]. If superficial veins are involved they often present the picture of tender, raised, cord-like structures. The appearance of the skin varies. It may be warmer than that of the opposite leg and cyanotic, or pale and cool as a result of reflex arterial spasm. The latter usually lasts for only a few hours. As the large veins, such as the femoral and external iliac, become involved, moderately severe pain may arise from the buttock, calf, or diffusely from the entire limb. With further extension tenderness may be elicited also in Scarpa's triangle or Hunter's canal. When the process is this extensive there will be moderate fever, leucocytosis, and elevated sedimentation rate and pulse rate. The latter two are frequently out of proportion to the fever[29].

A laboratory test to indicate the imminence of thrombosis is needed. Although several procedures have been suggested[30], none of these is of practical value[31]. Early diagnosis is still dependent upon the clinician's diagnostic acumen.

### *Prevention*

In the present state of our knowledge when so many emboli are sudden, unexpected and, even worse, fatal, the need of an adequate, practical, and safe program of pro-

phylaxis is obvious. The present concept of prophylaxis may be considered in three parts: (1) general measures, (2) surgical measures, and (3) chemo-prophylaxis.

There are proponents of each form of prophylaxis[2,15,18,20,26b,30a,31,32]. Perhaps the best procedure would be to weigh carefully the proneness of each individual patient to develop thrombosis, and then use one, two, or three of these forms as needed.

Venous stasis has long been recognized as an important factor in the development of thrombosis. There are reports however, which state that measures instituted to correct venous stasis have not altered statistically the incidence of thromboembolism[2,26b]. Leithauser[32c], however, believes that this is due to the absence of a standardized and vigorous regimen. Postoperatively, he institutes ambulation as soon as the patient recovers from the anesthesia. In all patients periodic ambulation must be achieved if at all possible, even if only a few steps can be taken. Serious cardiac disease is very frequently associated with thromboembolic phenomena[21,33], and yet the patients with this difficulty are often kept in bed for prolonged periods. Fowler[14] advocates ambulating the patient with myocardial failure as soon as severe dyspnea disappears. During the time the patient is in bed, standard leg exercises should be performed every 30 minutes to an hour, if he is likely to be inactive. This should not be left to the patient's discretion. A written order should be left for a competent nurse, instructed in this particular method of exercise, to supervise the procedure and record it in the nurses' notes. The exercises should consist of repeated and successive flexion and extension of the toes, ankles, and knees. Sedatives and narcotics should be used sparingly. The patient should not be allowed to remain in Fowler's or even semi-Fowler's position while in bed, for this impedes venous flow behind the knee and at the inguinal region. A flat or slightly Trendelenberg position is desired. Prolonged sitting in a chair is inadvisable for the same reason, plus the fact that the dependent position of the legs impedes venous return. Elastic leg supports are advantageous in that they exert their effect continuously and are widely applicable. They should extend from below the ankle to the knees at least. A common error when using elastic bandages is failure to elevate the lower extremities and adequately drain the venous channels prior to application of the bandages. When the lower extremities are in a dependent position at the time of the wrapping, inadequate drainage occurs. The patient will usually be most cooperative in these procedures if the time is taken to explain their importance. It is important to realize that exercises and elastic supports are preventive measures; once a leg thrombosis has developed they are contraindicated[34].

The use of vein ligation as a prophylactic measure is qualified by some writers[18,35] and rejected by others [26a,30a,32c,36]. The disadvantages of this measure include the necessity for bilateral ligation in most patients, the possibility of embolism even after ligation, the development of thrombi at other sites, and the associated edema and discomfort. Superficial femoral venous ligation has been suggested for use under the following circumstances: (1) the presence of contraindications for anticoagulant therapy, including lack of adequate laboratory facilities for control, (2) suppurative thrombophlebitis, (3) repleated occurrence of pulmonary emboli despite an adequate attempt at anticoagulant therapy, and (4) elderly patients with a past history of thromboembolism[14,18,35].

The anticoagulant drugs have earned a permanent place, both in the treatment and in the prevention of intravascular clotting. Indications for their use continue to grow in number. They are recommended for prophylactic use during the induced diuresis of patients with congestive failure who are debilitated, when early ambulation is difficult, when there is atrial fibrillation, marked arteriosclerosis, a past history of thrombosis[21,22], and also in frostbite and vascular surgery. Anticoagulants have reduced the incidence of thromboembolism from 12 to 2 per cent among general surgical patients[26a] and from 7 to less than 0.2 per cent in patients having gynecologic procedures[32a].

The gravity of this complication has been well shown by Bauer[15a] who reported the overall mortality of patients with thromboembolic phenomena as 17 to 19 per cent. Homans[37] stated that 50 per cent of venous thromboses are followed by pulmonary emboli, and that 20 per cent are followed by fatal pulmonary emboli. Pulmonary embolism is the cause of 3 per cent of all hospital deaths and 5 per cent of postoperative deaths[14,28].

### *Therapy*

The treatment of intravascular clotting, particularly of the lower extremities, is the source of much controversy. The differences of opinion center in the relative advantages of vein ligation and anticoagulant therapy. As knowledge in the management of anticoagulant therapy grows and as new prothrombinopenic agents become available, this form of therapy steadily gains proponents.

*Ligation*

The surgical method more likely to prevent embolism from thrombosis of the veins of the lower extremities is ligation of the inferior vena cava. Ligation of the femoral vein does not always prevent extension of the thrombus above the site of ligation or the development of thrombosis in the opposite leg or pelvic veins[35]. Vena caval ligation not infrequently results in swelling of the legs, which may be painful from recurrent local thrombophlebitis, and ulcerations. Homans[37] advises inferior vena caval ligation only as a last resort when repeated emboli have occurred despite peripheral ligation, and after adequate anticoagulant therapy. He believes that certain forms of peripheral venous thromboses in which pulmonary embolism has not occurred can be handled medically. Bilateral vein ligation should be reserved for recurrent embolization, septic thrombophlebitis, and thromboses which cannot be controlled with anticoagulant drugs.

*Sympathetic blocks*

Paravertebral lumbar sympathetic block and the sympathetic blocking drugs play a definite but small role in the treatment of venous thrombosis. Their usefulness is important only when there is generalized vasospasm of the involved leg or both extremities. The latter is not common and their use is seldom indicated[38]. Severe leg pain only partially relieved with analgesics, and persistent edema in iliofemoral thrombosis are frequently relieved with sympathetic blocking. As the sympathetic blocking drugs are further improved, undoubtedly they will completely replace the lumbar parvertebral block. They, of course, have the advantage of safety of administration even after anticoagulant therapy has been instituted.

*Anticoagulant therapy: heparin*

There are general measures which aid in the treatment of acute venous thrombosis. The affected limb should be placed at rest and elevated. Active and passive exercise should be halted in presence of thrombosis. If signs of inflammation such as redness, swelling, and tenderness are present, the limb should be kept warm with dry or moist heat. This may be accomplished with the thermo-regulated cradle or with warm, moist packs. The most important part of therapy, however, is the role of the anticoagulant drugs.

The objectives in anticoagulant therapy are twofold: (1) arresting the propagation of the thrombus and therefore the complications of thrombosis, and (2) preventing the formation of thrombi at other sites. In the establishment of anticoagulant therapy an immediate effect is usually desired. This is best afforded by heparin or heparin-like drugs. Heparin reacts with prothrombin in a manner which prevents its conversion to thrombin. Also, with the aid of a plasma albumin factor, heparin co-factor, it inactivates thrombin[36]. Heparin therefore interferes with the formation of thrombin and also inactivates any thrombin which is present. In addition, it also has an antithromboplastic action and decreases platelet adhesiveness[28].

The use of heparin has several advantages over that of the coumarin preparations. It affords immediate protection, the coagulation time is easier to determine than the prothrombin time, and there are less individual variations in requirements. Also, the danger from hemorrhage is less because the duration of action of heparin is short. Disadvantages of heparin administration are the lack of a satisfactory oral preparation and its expensiveness. The sublingual route for heparin administration has proved ineffective[39].

The desired effect of heparin is prolongation of the clotting time from a normal of 5 to 12 minutes to a therapeutic range of 20 to 30 minutes. Within one hour after administration 80 per cent of the inactivated heparin is excreted by the kidneys and the clotting time returns to normal in two to six hours. This necessitates a maximum of a four to six hours interval between doses. The clotting time should be obtained prior to each administration. A schedule which is usually

satisfactory is an initial intravenous dose of 75 mg. and an average of 60 mg. every four hours.

Some physicians[40] use a continuous intravenous method of administration in which 100 to 200 mg. of heparin in 1,000 cc. of saline or glucose is allowed to flow into the vein at the rate of 20 to 25 drops per minute. Prolonged intravenous infusions, however, can be very uncomfortable for the patient. In an effort to diminish the number of daily administrations required, concentrated solutions of the drug have been used subcutaneously and intramuscularly. Jorpes[41] believes that a large portion of the heparin administered in this fashion is inactivated by tissue thromboplastin, and reports severe reactions, with the formation of hematomas at the injection site. Others have found this a more satisfactory preparation[42].

Two repository preparations of the drug, Heparin/Pitkin* and Depo-Heparin†, produce a sustained reduction of coagulability of blood. The initial dose of Heparin/Pitkin is 400 mg., and 300-400 mg. is given in deep subcutaneous tissues every 24 to 48 hours as needed.

The admistration of these long acting heparin preparations is often accompanied by considerable pain at the injection site. Loewe[43], however, reports, that this pain is minimal with the newer Heparin/Pitkin* menstruum and advocates its use, because it is safe and requires an average dosage of 300 mg. only every other day. Depo-Heparin is also given in deep subcutaneous tissues, but requires at least daily administration. In the event that the clotting time is unduly prolonged with heparin therapy, 40 to 50 mg. of protamine administered by the intravenous route will neutralize 50 mg. of heparin. Furthermore, if one of the repository preparations is being used, its absorption can be slowed by applying an ice pack to the injection site. The action of protamine is of short duration, and, if it is necessary to reduce the clotting time prolonged with the repository forms of heparin, repeated doses of protamine may be necessary. The sudden reduction effected by protamine in this manner will not precipitate thrombosis[44].

The usefulness of two synthetic heparin-like preparations is being determined. Paritol has about one-seventh the potency of heparin; the onset of action is the same, but the effect lasts 12 to 14 hours. It must be given intravenously, for it causes extreme pain, redness, and swelling when given intramuscularly or subcutaneously[45]. The severe shock-like reaction—hypotension, hemorrhage, edema, paresthesia, and alopecia—which occasionally occurs with the administration of Paritol will probably prevent its use. Treburon is another synthetic substitute which will prolong clotting time to 30 minutes when given intramuscularly every 12 hours. Its activity is one-third that of heparin, more nearly approaching heparin in activity and toxicity than any of the other synthetic compounds studied. Comparable therapeutic doses of heparin and Treburon were found by Mangiere, Engleberg, and Randall[46] to be removed from the circulation or inactivated at about the same rate.

*Warner-Hudnut-Chilcott
†Upjohn Company

*Anticoagulant therapy: Dicumarol*

Dicumarol, a synthetic preparation, was the first of the coumarin compounds to receive clinical favor. The advantages of these compounds are their relative inexpensiveness, as compared to heparin, and their effectiveness by oral route of administration. In addition to Dicumarol, Tromexan (ethyl biscumacetate), anticoagulant #63 (4-hydroxycoumarin), and the indanedione derivative, phenylindanedione, are at present under clinical investigation. All of these drugs have similar actions, are equally effective in preventing thrombosis, and their use presents the same hemorrhagic risk. After administration Dicumarol is carried to the liver where it remains for some time, being gradually excreted via the bile into the intestine. Most of it is then excreted in the feces, but a small part is reabsorbed to be excreted in the urine. The site of action of Dicumarol is the liver. It has been shown that after administration of the drugs in animals, the liver fails to secrete prothrombin into blood profused through it[47].

The coumarin compounds have a similar structure to vitamin K and probably compete with the vitamin in the formation of an enzyme essential to prothrombin production. Since they interfere only with the formation of prothrombin, the prothrombin already present must be used up before an effect is noticed. The rather slow and variable absorption from the intestines is another factor delaying their onset of action. Prothrombin activity as indicated by the one-stage

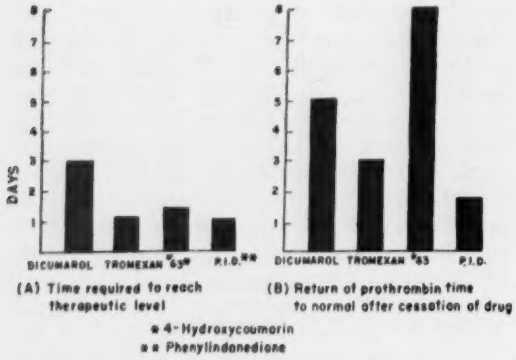


Fig. 2. A comparison of coumarin compounds and phenylindanedione.

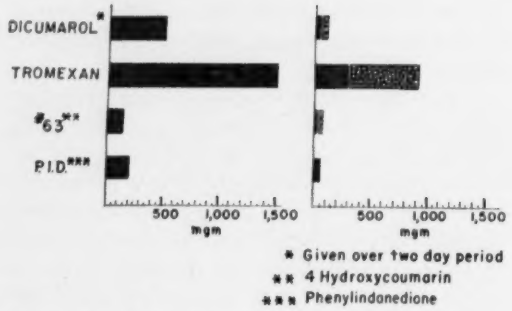


Fig. 3. Relative doses of coumarin compounds and phenylindanedione.

Quick prothrombin time is usually used to indicate the adequacy of therapy. The coumarin preparations and phenylindanedione differ in potency, the length of time required to attain a therapeutic level, and their ability to maintain a relatively constant level of prothrombin activity. From figure 2 it will be noted that, while phenylindanedione produces a therapeutic level of prothrombin activity more rapidly than the other drugs, there is little difference in this respect between Tromexan, anticoagulant #63, and phenylindanedione. Dicumarol however, requires 2 to 4 days to produce its maximum therapeutic action.

After cessation of therapy there is a considerable difference between the drugs in the time required for the prothrombin time to return to normal (fig. 2). Phenylindanedione has the advantage of a more rapid return to a normal level in the event of undue prolongation of the prothrombin time or hemorrhage. Anticoagulant #63 and Dicumarol are more effective in that they cause less fluctuation of the daily prothrombin level[48] and need be given in daily doses only, but Tromexan and phenylindanedione are equally effective when given in *divided* doses[49]. Figure 3 shows the relative potency and dosage schedule for these preparations. The response to these drugs varies greatly from one individual to another and dosage must be regulated according to the individual patient's response as shown by daily prothrombin time determinations.

The schedule most commonly used when rapid protection against thrombosis is desired is to institute therapy with heparin, 50 mg. every four hours, after control clotting and prothrombin times are obtained. The coumarin preparation is begun simultaneously, and the heparin is discontinued when the prothrombin activity reaches 30 per cent of normal or less. It is desirable to maintain the prothrombin level between 20 and 30 per cent of normal.

The usefulness of anticoagulants is enhanced by the possession of an agent which will counteract their action in case the prothrombin time is unduly prolonged or hemorrhagic complications occur. Vitamin K, in fulfilling this role, is believed to act by decreasing the time the courmarin drug is retained in the liver[47]. The synthetic water soluble preparation, Menadione, will return an excessively prolonged prothrombin time to the *therapeutic* range in 18 to 24 hours, but vitamin $K_1$ will return the prothrombin time to *normal* in 6 to 12 hours[48,50]. In the event of hemorrhage or the need for immediate surgery, vitamin $K_1$ is indicated. The effective dose is 100 to 250 mg. and it can be given intravenously as a 5 per cent emulsified solution[51], but the oral route is almost as rapid in reversing the prothrombin time[48]. The above dosage of vitamin $K_1$ rarely produces refractoriness to the coumarin drugs, whereas large amounts will do so[49a]. When excessive hypoprothrombinemia occurs in patients in whom thrombosis remains a danger and in whom there is no immediate imminence of hemorrhage, Menadione should be used to return the prothrombin time to the therapeutic range. Wright[49a] advises the use of whole blood in hypoprothrombinemia in the presence of propagating thrombi, for the whole blood will retain the prothrombin time at a low level for only a short time.

*Contraindications:* The most important contraindication to the use of anticoagulants

is the lack of adequate laboratory facilities for accurate prothrombin determinations. Organic contraindications are blood dyscrasias, significant hepatic or renal insufficiency, recent operations on brain or spinal cord, recent threatened abortion, ulcerative lesions of gastrointestinal tract, and pregnancy. Recently it has been reported that the coumarin drugs are not unduly hazardous during pregnancy if their usage is not prolonged[51b].

Recent work has indicated that streptokinase may be of use in the lysis of intravascular clots, but it is as yet only in the early investigational stage[52].

The death rate from intravascular clotting, recognized and adequately treated, has been reduced considerably[53-60], but the problem remains a challenge for early diagnosis and proper treatment.

## *Summary*

Damage to the intimal surface, decreased speed of blood flow, and a lack of suspension stability of the cellular elements of blood are physical factors which may instigate or enhance intravascular clotting.

Considerable progress has been made in our understanding of the coagulation mechanism. The importance of autocatalytic reactions has been emphasized. Much of the present controversy revolves around whether the reactions are enzymatic or stiochiometric.

Early diagnosis of intravascular clotting remains difficult. There is a real need for greater diagnostic acumen and for a simple laboratory test which will indicate the imminence of an intravascular thrombosis. With an increased understanding of physical factors which are important as instigators of clotting, measures directed toward prevention should be more effective.

Anticoagulants have earned a permanent place in the treatment and prevention of intravascular clotting. An oral preparation whose therapeutic level can be determined accurately without complex laboratory facilities and whose effect can be quickly and safely counteracted is needed.

With improved therapeutic tools it becomes increasingly important that the challenge of prevention and early diagnosis of intravenous thromboses be met.

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# ANESTHESIOLOGY IN MEDICAL PRACTICE

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The administration of anesthetics continues to be, as it has been for more than a hundred years, a very important part of the ordeal of surgery. It is important to the patient because of its terrifying uncertainty and possible unpleasantness; to the surgeon because of his desire to have good operating conditions; and to the medical profession as a whole because it is literally an everyday procedure which affects everyone who has any kind of an operation and everyone who has a baby. Anesthesiology affects the practitioner's pocketbook as well as his professional interest.

Developments during the past 30 years which have brought new methods and new drugs have tended to make anesthesia *relatively* safe and *almost* pleasant. But we must not fool ourselves into believing that anesthesia is altogether without hazard. For each patient the experience of anesthesia still remains a veritable journey into the "valley of the shadow of death," where actually the anesthetist takes the life of the patient into his hands and guides him past many a "rock and treacherous shoal." More people in the United States will die this year from anesthetics than from poliomyelitis. Because anesthesia is a matter of life or death, and because it involves a direct physician-patient relationship, I believe it will be worth while to examine some of the factors which make modern anesthesia so relatively safe and yet so potentially hazardous.

## *Apparatus*

When I started giving anesthetics 35 years ago, the whole anesthesia equipment of our hospital consisted of a wire mask, a bottle of ether, and a bottle of chloroform. Now we have airways, tubes, laryngoscopes, suction, oxygen, gases, intravenous anesthetics and infusions, relaxants, local and regional agents, analeptics, and a host of other agents and gadgets. All these have their place, and certainly their introduction into clinical practice has been exciting and interesting, but I think the most important adjunct today to the hands and brain of the anesthesiologist is the *endotracheal tube*. Ability to maintain in our patients a free and unobstructed airway is vital to modern anesthesiology. Oxygen is the very elixir of life (Wesley Bourne has called it "the ambrosial fluid"), and often the endotracheal tube becomes the veritable lifeline whereby we place oxygen within reach of the red blood cells. In the old days, following an induction with open drop ether, our patients often struggled, spluttered, choked, vomited, or jumped off the table, but they seldom stopped breathing. I don't want to go back to those bad old days, but the vaunted safety of ether lies in its lack of respiratory depression. Today we quite properly give our patients premedication in order to allay apprehension, then we induce anesthesia with intravenous Pentothal, and follow this perhaps with cyclopropane and curare. In other words we pile one respiratory depressant on top of another, and ability to control the patient's respiration becomes of vital importance.

There is no secret skill or mystery in connection with the use of laryngoscopes and endotracheal tubes, of which many varieties are available. My own favorite laryngoscope for routine use is the one designed by Professor Macintosh of Oxford (available from Foregger Company); and I like to use either a Portex Magill tube or a semi-rigid plastic endotracheal tube, with a malleable copper wire as a stilette for use in difficult intubations. Like every other technique, "practice makes perfect," and the only way to learn intubation is to intubate. Not only the specialist in anesthesiology, but every general practitioner should be able to use a laryngoscope. Apart altogether from the value of endotracheal intubation in anesthesia, it is a useful procedure in maintaining an unobstructed airway in patients who are unconscious for any reason. Cases are on record where unconscious patients have breathed through endotracheal tubes for as long as six weeks and subsequently recovered without permanent damage.

## *Agents*

Evipal, Pentothal, Surital and other intravenous anesthetics are so pleasant for the patient that they have done much to remove the fear of anesthesia. These drugs are a boon which we would not want to be without. Yet a word of caution about their abuse is needed. They are deceptively easy

Read before the First General Session, Medical Society of the State of North Carolina, Pinehurst, May 12, 1953.
From McGill University, Montreal, Canada.

to administer, but not always easy to control. Pentothal is a good hypnotic, but a poor analgesic. It should be used only for induction of anesthesia which is to be prolonged with inhalation agents, or for use by itself only in very short operations. It should never be given in concentrations stronger than 2½ per cent, and it should not be used in the presence of respiratory obstruction, in cases of shock, hemorrhage, marked obesity, or in the very old.

The most controllable of all anesthetic agents are the gases — nitrous oxide, ethylene, and cyclopropane. This is because they are almost completely excreted by the lungs, and are rapidly eliminated in the same way as they are administered. In order to administer the gases efficiently, atmospheric air must be entirely excluded, so it is essential that oxygen always be mixed with the gas in sufficient proportion to support vital metabolism. Since with nitrous oxide it is sometimes difficult to keep the patient asleep and at the same time keep him well oxygenated, anoxia or hypoxia with all its damaging sequelae may result. Hypoxia may mean more than cyanosis—it may mean irreversible cerebral or renal or hepatic damage. For this reason I prefer for general use the gas cyclopropane, which permits an excess of oxygen at all times and is a potent, nonirritating, controllable anesthetic agent. One can kill patients with cyclopropane, but it is one of the safest of agents when properly used. Because of its advantages we choose cyclopropane for our poorest risk patients, including those with serious heart disease. Ethylene has a wonderful record from the point of view of absence of pathologic effect. There has been a tendency in recent years to forget this fine agent, which I think should be re-evaluated, especially as to its possible use in modern heart surgery.

The addition of curare and other muscle-relaxing drugs has greatly widened the practical application of the anesthetic gases. Our experience with curare, which extends now over 11 years, tends to confirm our first impressions that its use eliminates the need for toxic deep anesthesia. I am aware that some have criticized the use of relaxant drugs, but I am sure that any evidence there may be for increased operating room mortality is based on misinterpretation of all the factors involved. Wherever curare has been used by careful anesthesiologists, within the recommended clinical dosage, in combination with proper anesthesia, and with the maintenance of good oxygenation, it has been a blessing to patient and surgeon alike. The new muscle relaxant drug, succinylcholine (Anectine) will probably largely supplant d-tubocurarine, because of its short action and its controllability. When succinylcholine is given as an intravenous drip in dilute solution, its rate of flow may be so regulated that abdominal muscle relaxation may be turned on or off as the exigencies of the operation require; and, because the drug is so rapidly broken down and metabolized, the side effects are negligible.

*Spinal Anesthesia*

There is much difference of opinion at present regarding spinal anesthesia. In many places the method has fallen into disrepute because of reported deaths or neurologic complications. Rather paradoxically, in my own hospital we use more spinal anesthesia than we did before the introduction of curare. I feel that this is because we have learned to use safe dosages and techniques, and to limit its use to comparatively safe procedures. In upper abdominal and thoracic surgery, and in all very long operations on poor risk patients, we prefer to use endotracheal cyclopropane, depending on one of the curare-like drugs for relaxation. However, 65 per cent of our vaginal deliveries, and almost all of our cesarean sections, hysterectomies, and minor rectal operations are done under spinal anesthesia. We use minimum doses of dilute solutions (6 to 10 mg. of 0.1 per cent Pontocaine, or 50 to 60 mg. of 1 per cent procaine) and keep our patients well sedated, but also well oxygenated and well hydrated. I am sure that dilute solutions constitute a safety factor in spinal anesthesia, and we now hardly ever use hyperbaric solutions mixed with glucose. One may ask why use spinal anesthesia for such a routine physiologic procedure as the birth of a baby. I don't want to take the time here to go into all the arguments which have influenced our judgment, but I think we should remember that if we are to provide the parturient woman with any anesthetic at all, there is bound to be some element of danger. Many women come to the delivery table very badly prepared for general anesthesia, and literally hundreds have died from aspiration into the lungs of undigested food. Others have died from overdoses of chloroform or

ether, and even such a supposedly innocuous procedure as caudal or paravertebral anesthesia is not entirely without danger. On the other hand, the type of spinal anesthesia we use provides a simple technique quickly performed, with no possible danger to the baby; and the dose used is so small that, even if it all went to the brain, the result could hardly be fatal.

While on the subject of obstetric anesthesia, I would like to say a word in recommendation of the drug, trichlorethylene (Trilene), which Dr. Ronald Stephen brought here from Canada and has done much to popularize in the United States. Trichlorethylene is an excellent analgesic when it is administered in small amounts, either with air in a special inhaler, or in combination with nitrous oxide and oxygen. This drug is not as good an anesthetic agent for general surgery as are many others, but its extraordinary analgesic properties make it especially valuable in obstetrics and dentistry.

*Regional Nerve Block*

There is a widespread belief that anesthesia administered by local or regional nerve block is so entirely safe that this method should supersede general or spinal anesthesia wherever it is technically possible. I agree that regional nerve blocks have a wide field of usefulness for both surgical anesthesia and pain therapy, particularly when in the hands of experts, but like every other medical procedure, the method is not without danger. Untoward reactions from local anesthetics, leading even to death, are by no means uncommon, and should never be forgotten. Death under such circumstances is usually preceded by convulsions.

Since convulsions produce asphyxia, which may be the immediate cause of death, I believe the first step in the treatment of severe reaction to local anesthesia should be the maintenance of adequate oxygenation, preferably by endotracheal controlled respiration. The patient should also be given intravenous relaxing medication, such as Pentothal or succinylcholine. These measures are much more effective than any of the ordinary cardiac or respiratory stimulants given by hypodermic. Dangerous accidents with local anesthetics can usually be avoided, however, by sticking to conservative doses of such tried and trusty drugs as procaine for field or regional block, and cocaine for topical application. I am not enthusiastic about any of the newer and widely advertised local anesthetics—particularly those which promise very long-lasting anesthesia. In using caudal, epidural, or paravertebral block, the anesthesiologist should always be conscious of the possibility of penetrating the subarachnoid space. Fatal accidents have resulted because the dose injected is very much larger than one ever uses in spinal anesthesia.

*Cardiac Arrest*

If anesthetics are administered by intelligent physicians using controllable and well tried anesthetic agents, with plenty of oxygen on hand and the means of supporting respiration immediately available, there is very little danger of cardiac arrest. Man is an animal, however, with infinite variations; so even under the best of circumstances this complication does sometimes occur. As soon as it is established that the heart has actually stopped, anesthesiologists should be prepared to open the thorax without delay, grasp the heart and massage it. Cardiac arrest does occur now with some frequency in open chest operations. In such circumstances immediate treatment is easy and usually effective. Cardiac arrest during ordinary surgery, however, should be extremely rare. I have not seen a case personally for the last 20 years, in spite of a large clinical practice.

*Operating Room Explosions*

Operating room explosions form another complication of anesthesia which make good newspaper publicity, but which are fortunately rare. I do not wish to go into this subject other than to remark that static sparks are responsible for most of the serious explosions. Static is often mysterious and hard to control, but everyone who gives anesthetics should make it his business to become familiar with the well established principles of humidity control, conductive materials, and electrical intercoupling which are now recognized as minimizing the dangers of static sparks. Merely attending to such things as electric switches, cauteries, open flames, and ground wires, may lead to a false sense of security. Fatal explosions, however, are probably the least common cause of deaths due to anesthesia.

*The Importance of the Anesthetist*

The greatest safety factor in the administration of an anesthetic is the intelligence,

ability, and experience of the anesthetist. Some years ago a learned French Canadian judge summed up the qualifications expected of an anesthetist in these words—

> " . . . The administration of a general anesthetic is at the same time a science and an art; easy, this science and this art, when all goes well, that is to say when no complication or difficulty arises in the patient, difficult and exacting of skill and experience, when a sudden and dangerous complication arises (these complications vary with the patient and never present exactly the same aspect) being able to cause death very rapidly, if a competent anesthetist, experienced and knowing how to act quickly in this particular complication, is not ready to cope with it with the discretion, the precision, and the ability which can come only from the union of medical science with experience; during the operation the life of the patient rests in the hands of the anesthetist quite as much as in those of the surgeon himself, and any complication resulting from the anesthetic puts the life of the patient in the balance . . . It follows that . . . one cannot be too careful in the choice of this man . . .; the reflexes, the pulse, the breathing, the color of the patient, these are the signs which would speak in a certain way to a specialist in anesthesia, and which by keeping him constantly informed of the condition of the patient, permit him not only to protect the patient by intervening at a critical moment, but also to **foresee** and **prevent** such a critical moment; that which constitutes the value of a medical anesthetist having a knowledge of physiology, is his ability to perceive quickly a sudden complication which may arise, to act quickly, to do what should be done and nothing else . . ."

This is not to say that I think no one but a full-time anesthesiologist should ever give an anesthetic. Anesthesia can be efficiently conducted by a general practitioner, provided he takes the trouble to familiarize himself with safety factors such as I have outlined. It is difficult to see how nurses or others without medical education can ever be really good anesthetists, but I realize that local conditions make it necessary to employ such technicians in some parts of the country. It is incumbent on the medical profession, however, to make sure that the profit motive does not induce some hospitals and physicians to be satisfied with less than the best professional anesthesia service.

Good anesthesia should be available to patients in small hospitals as well as in the large teaching institutions. This can be accomplished if the doctors in a community will designate one of their number to look after anesthesia and make it financially worth while for him to devote at least part of his time to this specialty. Almost the whole of my own clinical practice has been conducted in a small general hospital of 125 beds, which during 30 years has built up a reputation of providing as good anesthesia service as is available anywhere. Our medical school affiliation came only within recent years — *after* a reputation for good anesthesia had been established. I do not envy the anesthesiologists who work in very large hospitals. They have many problems which I do not have to face. In a small hospital patients can be kept under such close personal observation that the best clinical work becomes possible. The same satisfactory situation in regard to anesthesia that prevails in our hospital might result in literally thousands of small hospitals throughout the nation, if some doctor would give intelligent leadership, and his colleagues would co-operate—even to the extent, perhaps, of sacrificing a few anesthetic fees which they might have had for themselves. If one doctor in a small hospital is designated to look after anesthesiology, he can also interest himself in postoperative recovery rooms, in oxygen and other inhalation therapy, in bronchoscopy, in infant resuscitation, in the treatment of poisoning, in diagnostic and therapeutic blocks, in blood transfusions and other intravenous supportive therapy — in fact, in all the important but so often neglected fields which in many small hospitals are just nobody's business.

### *Conclusion*

Anesthesiology today offers a wide and uncrowded field which should attract some of the best young men and women in the medical profession. To those who may be contemplating such a venture, I can say that my own experience has been satisfying from all points of view, and that if I had my professional life to live over I would go right back into anesthesiology.

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**Hypertension:** Obviously, hypertension which appears in young people must be looked on with more anxiety than that which shows up late in life, and we need to know more about the prognosis for such young persons. The mortality in women is definitely lower, except in type 4, than in men. For years I have been impressed by the fact that in women past 40 or 50 years of age hypertension is often not much of disease, but more a sign of age, like gray hair.—Alvarez, W. C.: Prognosis of Hypertension, Modern Medicine 21:68 (Dec. 15) 1953.

# THE ROLE OF ANESTHESIA IN IMPROVING SURGICAL MORTALITY AND MORBIDITY

DERYL HART, M.D.

DURHAM

During the past 30 years there has been a progressive expansion and extension of operative procedures into additional areas of the body, into the extremes of age, into progressively poorer risk patients, accompanied by a constantly improving surgical mortality and morbidity. Many factors have contributed to this favorable course of events: improved surgical technique; greater knowledge of physiology and physiologic chemistry; greater availability of blood, blood substitutes, and solutions for parenteral injection; improved diagnostic abilities and facilities; greater knowledge of, and ability to control bacterial spread and growth both within and without the body; the control of distention during temporary loss of intestinal function; early ambulation; new and improved anesthetic agents and supplements with increasing knowledge of their use under varying conditions—to mention only some of the more important developments.

With these developments, operating has become more and more a matter of teamwork. No longer can the surgeon give the patient proper care while operating alone, on a kitchen table, with the family physician, untrained and inexperienced in anesthesiology, giving the anesthetic. With surgery of the magnitude of many operations performed today, minute by minute observations by highly trained personnel are necessary in order to anticipate and counteract major systemic alterations and thus avert a catastrophy. While the surgeon is dealing with a local condition that may tax his ability and demand his full attention, the role played by the well trained physician- anesthetist, or the nurse anesthetist working under his supervision, becomes increasingly important in preserving the life of the patient.

A few years ago, after performing within less than 12 months' time two resections of the colon for two separate carcinomas in a woman 82 years of age, and with very little disturbance to her general condition, I jokingly told her that I had just learned what had been wrong with my surgery—"that I had not let the patients reach an age where they could take it." I might truthfully have stated without joking that the anesthesiology had advanced to the point where it can provide adequate narcosis with a variety of agents and techniques, administered by a professional group well grounded in the fundamental knowledge of their actions, thus fulfilling the great demands of modern surgery.

Read before the Section on Anesthesiology, Medical Society of the State of North Carolina, Pinehurst, May 13, 1953.

From the Duke University School of Medicine, Durham, North Carolina.

## *Contributions to the Reduction of Mortality and Morbidity*

How has the physician-anesthetist contributed to the lowering of the mortality and morbidity under increasingly more unfavorable conditions?

1. By his research, either alone or in cooperation with the chemists, he has learned more about the response of the patient to various anesthetic agents and supplements, has developed new anesthetic drugs and techniques, has determined the effectiveness and safety of muscle relaxants, has devised new and better apparatus for anesthetic use, and in this way has advanced the field of surgery. The results of his researches are then made available to the profession as a whole for use on all patients.

2. Suitable medical training of the anesthetist enables him to detect or to anticipate physiologic alterations during anesthesia and to act accordingly. This is particularly true in regard to the respiration and circulation, which must be watched constantly. He also must have a thorough knowledge of the fluid balance of the patient before, during, and following operation, as well as the indications for, the dangers of, and the relative desirability of saline, glucose in water, blood transfusions, and plasma expanders. It is a great relief to the surgeon to know that an expert equipped with facilities which he himself cannot use while operating in this field is watching the patient at all times, and will forewarn him of systemic dangers, thus enabling him to concentrate on the details of the operation. No longer does he get reports of a more feeble pulse with a rising rate, and give an order for adrenalin or caffeine sodium benzoate as a stimulant, as was almost routine even when I went into surgery. Shock is more often forestalled, and if not, is combated by effective replacement therapy, while the frequently ineffective stimu-

lant is seldom used. The surgeon no longer has the opportunity, on being told that the patient has already received the caffeine sodium benzoate ordered by him, to exclaim; "What! I wanted it for my first assistant." However, it is well known by all surgeons that if fluid is needed, adequate replacement is far better for the patient and makes the use of stimulants unnecessary.

3. The anesthetist's detailed knowledge of the pharmacologic action of anesthetic agents and auxiliary drugs enables him to consult with the surgeon in regard to the agent and technique of anesthesia to be used, and to make a change whenever the condition and response of the patient so indicates. He realizes that all narcotic drugs are toxic and, if given in excess, can cause irreversible changes. Also, since all drugs producing "surgical anesthesia" with the exception of ether depress respirations, he is prepared at all times to administer oxygen as needed, and manually to assist respirations, if necessary, to maintain the patient in the best condition. It is no longer necessary to use spinal anesthesia or to carry the patient down to the deepest plane of general anesthesia in order to get muscular relaxation.

A proper balancing of narcotic drugs and muscle relaxants in the presence of adequate oxygenation gives such ideal operative conditions that the younger surgeon of today may not realize the problem of "fighting" the distended intestine in the presence of obstruction with inadequate relaxation, or of closing the abdominal incision in the patient who cannot be relaxed except after prolonged and deep anesthesia. The surgeon who has attempted to close the abdomen of a patient after the spinal anesthesia has worn off in the days before continuous spinal was used, has had an experience which few of the younger surgeons today will ever have to go through with. The improved surgical conditions achieved by well trained anesthetists using modern anesthetics make life far easier for the surgeon, but what is really important, the operation is much less of an insult to the patient. There is less systemic disturbance, less operative trauma, and the anesthetic and postoperative course is far smoother and less hazardous.

4. With the installation of recovery rooms in hospitals, every patient (rather than only the one in shock) is kept under close observation by nurses trained in this special field, with suction, oxygen, bronchoscopic equipment, and other facilities available, and during all this time under the overall watchfulness of the staff of physician-anesthetists. No longer does the surgeon, in the middle of the next operation, receive an urgent call to come to the ward that the patient recently returned from the operating room is having difficulty in breathing, or that his pulse cannot be obtained, or that otherwise he is not doing well.

5. Oxygen therapy, which has contributed to a smoother postoperative course, quite properly has fallen largely on the shoulders of the physician anesthetist. Rapid recovery from the anesthetic and operative experience permits early ambulation, which improves both the circulation and respiration and further hastens convalescence.

6. Physician-anesthetists, adept in the use of the laryngoscope and bronchoscope, with the judicious use of intratracheal anesthesia, have largely relieved the surgeon of the worries attendent upon operating on the patient with an inadequate airway and partial asphyxia. The brain tumor patient dying from asphyxia secondary to laryngeal spasm during the operative procedure is seldom if ever seen, the patient with an open thorax is maintained in a state of excellent oxygenation, and the thyroid patient can have his operation performed without any interference with respirations.

### *Conclusion*

I would like to express my appreciation for, and pay my tribute to, the part played by the medically trained anesthetist in enabling the surgeon to expand his work in all fields, to undertake operations of greater and greater magnitude in patients who are poorer and poorer risks, and to obtain a constantly falling mortality and morbidity rate. The more complicated surgical procedures of the present day demand teamwork with a highly trained group of individuals to perform a variety of functions, and high on this list is the physician-anesthetist.

### *Discussion*

**Dr. Brian Sword:** Dr. Hart has emphasized a well known fact—that modern anesthesia has been responsible for many of our present day surgical procedures. There is no doubt that cardiac surgery, as it is practiced today, would not be possible without the well trained anesthesiologist with his knowledge of pharmacology of anesthetic drugs and respiratory physiology.

**Dr. Harold Griffith** (Montreal, Canada): Ever since coming to North Carolina, I have been impressed with the fact that your leading surgeons

are fully aware of the problems of anesthesia, and that you have the basis for a remarkably cooperative group here. Unfortunately, in the past, surgeons and anesthetists have not always seen eye to eye. All anesthetists are not quite so fortunate as I have been in my hospital, where our chief surgeon is my own brother and is five years younger than I am.

We at McGill feel that the strength of our teaching center in anesthesia is based principally on the cooperation that exists between our basic science teachers and our surgeons at the university and in the various hospitals.

**Dr. Deryl Hart** (closing): I would like to say that we in the Department of Surgery at Duke have, from the start, been aware of the importance of anesthesia. I class anesthesia in the field of surgery because the two are inseparable. You might put a few patients to sleep without operating on them, and you might operate on a few patients without putting them to sleep, but you probably wouldn't do many operations without some form of anesthesia.

Physician-anesthetists are rare, but not as rare now as they were 10 years ago. I take my hat off to Dr. Stephen and other anesthesiologists for the time they give to training students, as contrasted to the time they spend in anesthesia.

If every institution that is now equipped to train physician-anesthetists is taxed to the utmost, it will still take a long time to make up the present deficit.

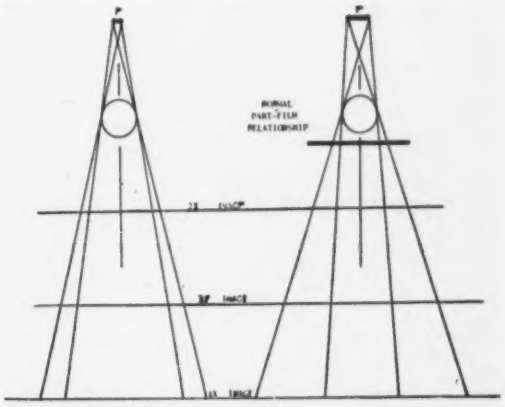

**Fig. 1. Relation of Focal Spot to Sharpness of the Radiographic Image. The 0.3 mm. focal spot (left) produces approximately the same degree of ill definition in a two-fold enlargement as is produced by a 1.5 mm. focal spot (right) at conventional object-film distance. A focal spot of ordinary size is not satisfactory for the production of radiographic enlargements because of the very large penumbra produced at extended object film distances, which results in a blurred image (see fig. 2).**

## ENLARGEMENT RADIOGRAPHY WITHOUT SPECIAL APPARATUS OTHER THAN A VERY FINE FOCAL SPOT TUBE

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*and*

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CHAPEL HILL

Some enlargement of the object examined is present in all medical radiographs. At times it is desirable to keep magnification at a minimum in order to depict the true size of an object. On other occasions an enlarged shadow may facilitate diagnosis. To be helpful, an enlarged radiographic image must be well defined. To make enlargement methods available to the greatest number of patients, all but essential special apparatus should be eliminated. It is the purpose of this paper to describe several simplified techniques for producing enlarged radiographs of superior diagnostic quality, and to discuss certain areas of clinical usefulness of this procedure.

### *Prior Investigation*

Engineering developments of recent years have made possible smaller focal spots in radiographic tubes (Burger, Combee, and van der Tuuk[1] and Stevenson[2]). When the focal spot is reduced to a small fraction of a millimeter (0.3 mm.), fine detail in radiographs may be preserved even with magnification of the part examined. If a conventional focal spot be employed, the large indistinct penumbra and the small true image shadow make magnification useless (figs. 1 and 2).

The amount of enlargement produced during a radiographic examination varies with the mean distance from the object of interest to the film, and is related to the target-film distance. Varying magnification may be produced at will by altering the relationship between the x-ray tube, the object, and the film. Experiments indicate that the maximal useful magnification of anatomic structures, when the 0.3 mm. focal spot radiographic tube is used, is three to four times normal size (Garnes[3]). Greater enlargement results in a penumbra which forms a significan part of the total shadow. Enlargement to twice the normal size appears to be optimal for routine clinical work (Wood[4]).

The technical advantages and disadvantages of direct radiographic enlargement as compared to conventional radiography have been discussed by Burger, Combee, and van der Tuuk[1]. The limitations of magnifica-

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Read before the Section on Radiology, Medical Society of the State of North Carolina, Pinehurst, North Carolina, May 13, 1953.

**Fig. 2. Osteogenic Sarcoma of the Tibia. Enlarged radiographs made with a conventional 1.5 mm. focal spot (A) and with the 0.3 mm. focal spot (B) are compared. The production of a magnified image with an ordinary radiographic tube is impractical because the resultant poor detail impairs diagnosis, whereas enlargement with the very fine focal spot tube facilitates recognition of pathologic changes.**

tion of radiographic images by both direct radiographic and photographic methods have been reviewed by Gilardoni and Schwarz[5]. Photographic enlargement involves the making of an intermediate positive film by photographing the radiograph and then making an enlarged facsimile of the original radiograph by ordinary projection methods. The photographic method is time-consuming and, even if the facsimile is omitted and positive prints are made directly from the radiograph, special photographic apparatus and materials are required. A distinct advantage of direct radiographic enlargement is that it is rapid and lends itself even to wet film diagnosis.

*Apparatus and Technique*

The very fine focus is combined with a conventional focus of 1 to 2 mm. in an ordinary double focal spot tube housing in appratus now commercially available. Combination of the conventional and very fine foci eliminates the necessity of segregating one diagnostic area of a department for the production of enlarged radiographs. The tube may be adapted to almost any type of existing radiographic installation.

A simple manner of producing double-sized images is to place the radiographic tube 24 inches above and the cassette 24 inches below the object. For practical purposes it is satisfactory to dispose the anode of the x-ray tube 24 inches from the top of the radiographic table, and place the cassette on a step stool (or any other convenient support) at an equal distance beneath the table (fig. 3). The equal relation of the tube and film to the table top results in a slightly greater than double magnification of the interposed object placed on the table.

For best results, it is necessary to eliminate as much scattered radiation as possible. A radiographic cone extended as near the patient's skin surface as inclusion of the entire field of interest allows is helpful in examining all but the smallest anatomic parts. For dense parts such as the hip, skull and spine, the Potter-Bucky diaphragm, with the tray removed, may be placed beneath the part. This eliminates the necessity of a special focus grid on a custom built carriage

some distance beneath the table top. Comparative examinations support the geometric theory that elimination of scattered radiation immediately beneath the patient produces results equally as good as a moving grid directly over the film, 24 inches beneath the table top.

For examining the patient in the upright position, the radiographic tube may be turned to produce a horizontal x-ray beam (fig. 4). Any cassette-holding device may be used to examine the chest or other part not ordinarily requiring a grid to reduce scattered radiation, such as the cervical spine. For examination of heavier parts, an upright Potter-Bucky diaphragm is desirable, but a grid-front cassette will produce a radiograph of reasonably good quality on most occasions. Stereoscopic examinations may be performed with either the vertical or horizontal x-ray beam. Ordinarily the x-ray tube is shifted 2 inches in a line parallel to the long axis of the body to produce stereoscopic pairs of enlarged radiographs.

**Fig. 4. Method of Radiographic Enlargement in Examination of the Chest. The patient is placed in such a position that the midcoronal plane of the thorax is 24 inches from both the radiographic tube and a wall mounted cassette holder. The horizontal x-ray beam is directed toward the fifth thoracic vertebral spine. Two 11-inch by 14-inch films are exposed simultaneously, each receiving the enlarged image of one upper lung area (see fig. 7). If the lower lung fields are to be examined a second exposure is made.**

**Fig. 3. Method of Radiographic Enlargement in Examination of the Knee. The radiographic tube and the film are disposed equal distances from the object in order to produce a two-fold enlargement. A radiographic cone is extended as near the immobilized part as inclusion of the entire field of interest allows. When heavy parts are examined, the Potter-Bucky diaphragm (with cassette tray removed) may be brought into its usual position beneath the object.**

The diagnostic quality of a radiograph is judged largely on the fineness of detail. Many factors enter into the production of a roentgen shadow of fine detail, including elimination of motion in the part radiographed, elimination of scattered radiation, the size of the focal spot of the radiographic tube, the resolving power of the intensifying screen and the film emulsion, and the variations in density of the part examined. For many years emphasis has been placed upon speed of exposure, and many engineering improvements in equipment and elaborate mechanical devices have been developed to arrest motion during radiographic examinations. More recently, perfection of the rotating anode has made possible ultrafine focal spot tubes which, because they approach a point source of radiation, produce extremely fine radiographic images. Although very small focal spot tubes do not allow instantaneous exposure at high milliamperage, they have sufficient capacity to permit radiographic techniques rapid enough to exclude motion as a significant factor for examination of many anatomic parts.

When ultrafine focal spot tubes which may be loaded at high voltage (125 kv.) are used, exposure time may be reduced further in order to allow examination of heavy parts

**Table 1**
**Technical Factors in Direct Twofold Enlargement Radiography**
**(0.3 mm. Focus at 20 ma. and 48 in. TFD)**

| Part | Time | Kv. | Ma. Sec. |
|---|---|---|---|
| Chest Supine | | | |
| With Bucky | 0.3 | 80 | 6.0 |
| Without Bucky | 0.1 | 70 | 2.0 |
| Erect Chest (PA) | 0.1 | 80 | 2.0 |
| **(0.3 mm. Focus at 15 ma. and 48 in. TFD)** | | | |
| Skull | 10.0 | 65 | 150.0 |
| Cervical Spine | 3.0 | 64 | 45.0 |
| Thoracic Spine | 10.0 | 70 | 150.0 |
| Lumbar Spine | 10.0 | 75 | 150.0 |
| Hip | 10.0 | 70 | 150.0 |
| Shoulder | 0.4 | 70 | 6.0 |
| Elbow | 0.3 | 75 | 4.5 |
| Hand | 0.2 | 60 | 3.0 |
| Knee | 0.4 | 85 | 6.0 |
| Ankle | 0.3 | 80 | 4.5 |
| Stomach | 5.0 | 90 | 75.0 |
| Gallbladder | 6.0 | 80 | 90.0 |
| Kidney | 4.0 | 85 | 60.0 |

**Values given are for patients of average thickness.**

without motion. Capacity curves show that it is impractical to make exposures above 20 milliamperes, and for examination of parts which can be completely immobolized 15 milliamperes ordinarily are used. The factors necessary to produce enlarged radiographs of average density of representative anatomic parts are given in table 1. In enlargement radiography the milliampere seconds ordinarily used are slightly greater than in conventional radiography, as a result of an increase in target-film distance (Sante[6]). The quantity of radiation necessary to produce a comparable shadow may be reduced by increasing the kilovoltage, and thus the exposure time is shortened. The radiation dosage as measured in roentgens is increased approximately three times because of the shorter target-object distance and the increased exposure time necessary for enlargement radiography.

It is necessary only to consult the table of factors to appreciate that the ultrafine focal spot tube will perform reasonably heavy duty. The low milliamperage used does preclude examination of parts which are not only thick or dense, but in which motion cannot be eliminated. Nevertheless, direct radiographic enlargement techniques have permitted clinical investigation over a wide range.

### *Clinical Experience*

#### *Bones and joints*

Ease of immobilization in the musculoskeletal system has made examination of the bones and joints one of the natural avenues for early investigation. Fractures of certain

**Fig. 5. Simple Cyst of the Os Calcis. Conventional and enlarged radiographs of a bone cyst are equally reduced for comparison. Good radiographic detail is preserved with twofold enlargement when the 0.3 mm. focal spot tube is employed.**

bones—especially those manifested by deformity of the carpus, impaction of the femoral neck, and narrow lines of discontinuity in the vertebral arch—may be visualized to better advantage in enlarged radiographs than in conventional films. Enlargements also may help exclude fractures where linear shadows of diminished density of questionable significance are seen in ordinary films. Infections and tumors of bone are lesions for which radiographic enlargements often are valuable in diagnosis (fig. 5). Magnification has enabled Zimmer[7] to detect radiographic changes in the skull which previously were invisible. The same investigator has successfully used enlarged radiographs to demonstrate disease of the mastoids and paranasal sinuses. Enlargement methods have been found useful for study of the arthritides by van der Plaats and Fontaine[8].

In the diagnosis of intracranial disease the changes which occur in the sella turcica are of great diagnostic significance. Careful analysis of the remnants of bone following erosion of the sella turcica from pressure may give a clue to the nature of the underlying disease process. In difficult cases enlargements may make it possible to determine whether erosion results from an expanding process within the sella or generalized increased intracranial pressure.

#### *Soft tissue calcification*

Soft tissue calcification, which in ordinary

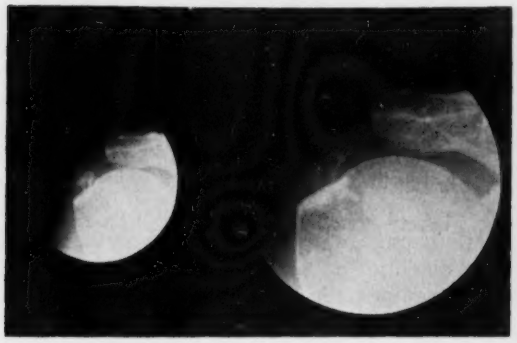

**Fig. 6. Peritendinitis Calcarea of the Shoulder. Calcium shadows which appear amorphous in conventional radiographs often are found to comprise multiple distinct deposits of mineral. Particles of calcium as small as the focal spot itself may be visualized as independent dense punctate shadows.**

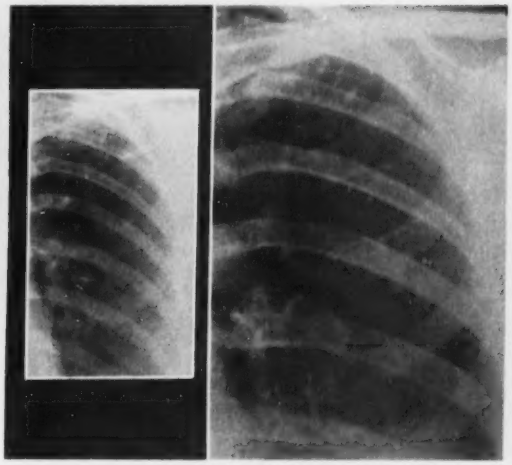

**Fig. 7. Fibroid Pulmonary Tuberculosis. In a two-fold enlargement (right), linear shadows in fan-like arrangement are sharply depicted, which are difficult to recognize in the conventional radiograph (left). Small shadows can be recognized more easily in enlargements, because they are better defined at their periphery. A series of enlarged chest radiographs is useful to detect minor changes in the lesions of pulmonary tuberculosis.**

films appears amorphous, may be found to have a distinctive internal arrangement of component calcium deposits when seen in enlarged radiographs. Particles of calcium density as small as the focal spot itself may be shown to be separate lime salt deposits (fig. 6). In one case, a calcium shadow which appeared homogeneous in a conventional film was shown in the enlargement to have a ring-like form, which led to a diagnosis of vascular disease.

*Respiratory system*

One of the most promising fields for the application of enlargement methods is the respiratory system. Intrapulmonary shadows which are absent on conventional films may be clearly seen in radiographic enlargements. In the normal lung, one or more branches of the pulmonary vessels, in addition to those visible in customary films, can be recognized in enlargements. If an ordinary chest film is viewed through a magnifying lens, the peripheral portion of the lung usually is devoid of markings, while in the enlarged chest radiograph, normal arborization of tiny pulmonary vessels may be seen in this zone. Other normal structures, such as bronchi seen end on and interlobar fissure lines, may be recognized. The limitations of radiologic methods for the demonstration of small pulmonary shadows in ordinary radiographs has been worked out thoroughly by Rigler[9] and others. Enlargement radiography appears to extend these limits.

Pulmonary lesions can be recognized more easily in enlargements because they are better defined at their periphery, with less discontinuity of the image outline than is seen in conventional films. The configuration of parenchymal shadows can be followed more clearly in enlarged films and their relation to the peripheral vascular branches can be appreciated (fig. 7). It has been possible to detect earlier favorable or unfavorable changes in the appearance of tuberculous lesions through study of a series of enlarged chest radiographs. In numerous enlarged chest films, punctate calcium deposits have been visualized within extraneous pulmonary shadows which were not demonstrated on ordinary six foot chest films. The importance of demonstrating calcification in solitary pulmonary lesions to differentiate benign processes from carcinoma has been emphasized by Abeles and Chaves[10].

*Other systems*

In diseases involving systems other than the musculoskeletal, nervous, endocrine and respiratory tract the usefulness of enlargement radiography appears to be limited narrowly. The 0.3 mm. focal spot tube capacity is inadequate at present to allow motionless depiction of structures of the cardiovascular system or the barium-filled alimentary canal. It is problematical whether further investigation will prove enlargement urography a valuable procedure. In general, dense con-

trast materials give a morphologic outline of sufficient sharpness to make it doubtful that enlargement alone can produce improved clinical results.

### *Comment*

The use of direct enlargement radiography has proven a valuable aid to the radiologist in selected cases, because in certain instances additional information is gained while at other times visualization of lesions is made easier. Additional information may result from clearness of abnormal or normal shadows not distinct on conventional films. On occasion, particularly in the lung, small shadows may be visible in enlargements which are invisible on plain films. While it is difficult to be certain when a soft tissue shadow so small is abnormal, the demonstration of tiny shadows of calcium density can leave no doubt regarding the existence of disease.

Evidence is lacking that enlargement radiography is the procedure of choice for survey studies or even as the initial step in the examination of ill patients. Rather, it appears best suited for detailed morphologic analysis to determine the pathologic significance of lesions known to exist. For detecting minute changes in shadows during the course of a disease—pulmonary tuberculosis, for example—use of enlargement radiography is promising, but a longer period of study is necessary to determine its true worth.

In radiologic teaching, direct projection of a film, or a lantern slide, ordinarily is employed to allow many people to view a radiograph simultaneously. Gross enlargement by projection methods, however, is not always a satisfactory substitute for direct viewing of the film. It is often preferable to emphasize details of diagnostic importance to students by use of a directly magnified radiographic image. Correlation of roentgen ray shadows with anatomic structures and pathologic changes apparently is made easier for many individuals through the study of enlarged radiographs.

### *Summary*

1. Enlargement radiography can be employed in the examination of patients by use of a radiographic tube having a focal spot which measures a small fraction of 1 mm., without the use of other special apparatus.

2. Any anatomic part that can be immobilized is particularly suitable for examination by enlargement methods. A technique for satisfactory examination of the lungs has been worked out.

3. Enlarged radiographic images are valuable because they often give additional information or make visualization of morphologic changes easier. As a second step, after the detection of an abnormality in an ordinary radiograph, enlargement may prove invaluable to determine the type of pathologic process present.

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The authors gratefully acknowledge the assistance of Mr. C. N. Cheek, R. T., in compiling data on radiographic technique.

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### *Discussion*

**Dr. Robert J. Reeves** (Durham): This paper has covered the subject so thoroughly that little is left for me to say except that the technique is unusual and very interesting. Private practitioners might find it a little more expensive, but in cases where it would be helpful, I think it should be used.

I wonder if the technique would be useful in mastoid disease. Frequently we have much difficulty in distinguishing between a minute area of necrosis and a small cholesteatoma. Would enlargement radiology be helpful in making the distinction, and would a grid cassette add or detract from the technique?

Lacking a 0.3. mm. tube, would you use a pin-hole camera or a pin-hole lead? Dr. Wood might also say whether or not it would be practical to use a pinhole for projection in cutting down the penumbra.

In any case, the technique is quite novel, and I think would be worth while in demonstrating fractures that could not be picked up by ordinary methods.

**Dr. J. Robert Andrews** (Winston-Salem): I am sure that Dr. Wood has made some comparisons in his own mind between enlargement radiology and optical enlargement of a conventional film, which obviously is not the same thing. I think it might be profitable to touch on that a moment.

Historically, in radiologic diagnosis any technique

which improves visualization of a part has remained in use, and I think this will be true in the present case.

**Dr. Wood** (closing): In answer to Dr. Reeves' question about cost, the tube itself costs no more than an ordinary double focal spot tube, and inserts containing this fractional focus may be obtained when there is need for replacement.

We have found the method of limited value in the diagnosis of mastoid disease, although Zimmer has used and praised it.

Grid cassettes certainly may be used in lieu of the Potter-Bucky diaphragm, with no increase in exposure time. Of course when the grid cassette or Bucky diaphragm is used, exposure time is increased in comparison to examination without it.

We have not tried to reproduce images of this type with a pin-hole lead. I would think that the chief disadvantage would be the lengthened exposure time necessary to produce results.

Dr. Andrews has inquired about the comparative value of optical enlargement and direct radiographic enlargement. In the normal chest, no intrapulmonary shadows are visible in the peripheral 1½ to 2 cm. of the lung field on an ordinary film, even when the film is viewed through a hand lens. With direct radiographic enlargement, minute branches of the pulmonary vessels can be visualized in the peripheral zone of the lung, and often they may be followed out to the pleura. Certainly, abnormal intrapulmonary shadows in the peripheral portion of the lung can be visualized most readily by direct enlargement radiography.

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# THE TREATMENT OF VASCULAR AND PIGMENTED NEVI IN INFANCY AND CHILDHOOD

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"Nevus" is a general term used to designate pigmented neoplasms of vascular and epidermal origin. In infants and children, nevi comprise, by far, the largest group of benign tumors[1]. Much has been written about their origin, clinical manifestations, and management. Many methods of treatment have been introduced enthusiastically, only to be abandoned when proved by the test of time to be inadequate or dangerous. It is the purpose of this presentation to review the methods of treatment, together with indications and contraindications, and to try to simplify the problems of clinical management.

Read before the Section on Pediatrics, Medical Society of the State of North Carolina, Pinehurst, May 12, 1953.

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## *Vascular Nevi*

The *vascular nevus* or *hemangioma*, has its origin in the angioblastic layer of embryonic mesoderm[2]. It is primarily a tumor of independently growing vascular channels. The small hemangioma has little anastomotic connection with the surrounding vascular tree, although the larger and more extensive tumors have main feeder vessels which may be tremendous. These tumors are classified pathologically into two groups: (1) capillary and (2) cavernous.

*Capillary hemangiomas* are the most common, and their treatment depends largely upon the pathologic makeup of the individual tumor. The *strawberry birthmark* or hemangioma simplex is composed of masses of capillaries lined with embryonic epithelium, while the *portwine stain*, in contrast, is a tumor of capillaries lined with adult endothelium. Eighty-three per cent of all these tumors occur about the head, face, and extremities[3], and all present serious cosmetic and functional problems requiring careful evaluation and treatment (figs. 1 and 2).

*Cavernous hemangiomas* are soft, compressible tumor masses which, on pathologic section, are found to be composed of large, thin-walled venous sinuses. In addition to the unsightly deformity, large cavernous hemangiomas may rupture through an area of superficial ulceration, and an exsanguinating hemorrhage may occur. Hemorrhage may be very difficult to control, because there is insufficient supporting stroma to permit the normal vascular retraction and clotting mechanism to work effectively. A cavernous hemangioma is comparable to an unharnessed river; if untreated, it will erode both soft tissue and bone with relative ease (figs. 3 and 4).

While vascular nevi are generally considered to be benign tumors, on rare occasions malignant degeneration does occur. Three separate malignant entities have been described; the metastasizing hemangioma, the hemangio-pericytoma, and the hemangio-endothelioma.

Hemangio-endotheliomas in children increase in size with great rapidity, and, because of this fulminating rate of growth, closely resemble a true malignant condition. Hemangio-pericytomas and metastasizing

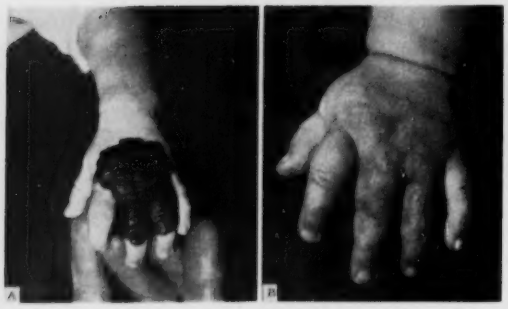

Fig. 1 A. This 2 month old infant was born with a large capillary hemangioma of the dorsum of the left hand, which had increased rapidly in size. In a single stage the entire tumor mass was surgically excised and resurfaced with a full thickness graft from the left groin. B. shows a completely functional hand 18 months after surgical treatment.

Fig. 2 A. This 3 month old infant had a capillary hemangioma of the left lower eyelid and inner canthus of the left eye removed surgically in a single stage. B. shows the postoperative appearance 18 months following excision and primary plastic repair.

Fig. 3 A. A one month old infant with a large congenital cavernous hemangioma of the postauricular area was referred because of superficial erosion of the skin and the danger of exsanguinating hemorrhage. Surgical excision and plastic closure was performed shortly after admission. B. The final result is shown three months following surgery.

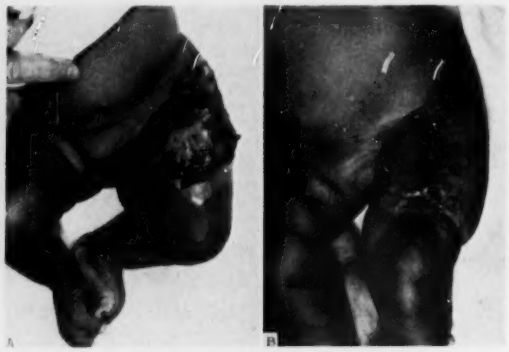

Fig. 4. A. This month old Negro infant was referred to the hospital for amputation because of an extensive ulcerating cavernous hemangioma of the left thigh, which had hemorrhaged on two previous occasions. Radical surgical excision and primary grafting was performed, with preservation of the nervous and vascular supply to the left. B. Five months following surgery the child had a complete range of motion.

hemangiomas are uncommon in children[4], and when they do occur, the tumor is more orderly in arrangement and metastasizes later than its adult counterpart.

*Methods of treatment*

The methods of treatment are almost as numerous as the authors describing them. All methods, however, tend to fall into three major categories — injection, irradiation, and surgery. With the notable exception of the portwine stain, enthusiastic claims have been made for all three.

The injection method of treatment is the oldest and most varied. Giraldez, in 1854[5], used the local injection of ferric chloride as a sclerosing solution in the treatment of "birthmarks." Since that time, many substances, including boiling water, quinine and urea, chloral hydrate, alcohol and silver nitrate, have been used with some degree of success[5,6]. At present, a 5 per cent solution of sodium morrhuate is the most widely used of the sclerosing solutions[7].

The lesions to be treated by injection should be selected with discrimination. Injection of sclerosing agents will be most effective in small, well circumscribed lesions. Occasionally, however, the subcutaneous spread of the tumor tissue may extend well beyond the surface manifestation, and the reaction to even small amounts of sclerosing solution may be alarming[8]. Owens[7] has stated that morrhuate does not have to come into actual contact with the endothelium to be effective; however, the indiscriminate and uncontrolled injection of powerful scler-

osing solutions, particularly in the larger lesions, may lead to extensive slough of tissue and serious cosmetic and functional deformity.

Radiation, either by x-ray or a radium shield, has been used in the treatment of cavernous hemangiomas and hemangioma simplex[3,9]. Pfahler, in his review[10], stated that radiation is most useful in the treatment of hemangiomas in young children, for it can be applied easily and painlessly, and without anesthesia. There are, however, disadvantages and contraindications which must be kept in mind in order to prevent the disastrous consequences of indescriminate irradiation therapy[6b]. Radium or roentgen therapy should never be used near the testicles, ovaries, or over epiphyseal lines and tooth buds, because of the danger of interference with these growth centers (fig. 5). Since the lens of the eye is very susceptible to irradiation, it should be used around the orbit only with extreme caution (fig. 2). Roentgen therapy over hair-bearing areas will produce permanent alopecia, and unless the normal skin is fully protected, roentgen dermatitis may appear as a late complication. The atrophic changes, telangiectasia and impoverished local circulation, so characteristic of this condition, may lead to recurrent ulceration and finally to malignant degeneration[11].

Surgical excision is the treatment of choice of vascular nevi of children. Under local or block anesthesia, supplemented with an analgesic agent, the lesion can be removed completely, leaving only a fine linear scar. Surgery is also preferable when injection therapy has failed or when irradiation is contraindicated[3,11,12] (figs. 2 and 5).

The portwine stain, however, is unique among hemangiomas. Although cosmetically one of the most deforming of all vascular nevi when it involves the face, there is no uniformly satisfactory method of treatment. Since the endothelial lining of the capillary bed is adult in type, this tumor is completely radioresistant. Carbon dioxide snow, electrodesiccation, tattooing of insoluble pigment as a cosmetic camouflage have been reported, but are not widely accepted. Although surgical excision and grafting has been gratifying to many patients, the final result is not always perfect. Experimental and clinical studies are now in progress, and preliminary observations indicate that a uniformly successful method of treatment will be presented in the near future. Cover-Mark, a cosmetic preparation, may be used with a considerable degree of success to camouflage portwine stains of the face[3,6a,7].

**Fig. 5. A. This 4 month old infant had an ulcerating, infected, hemangioma of the upper lip following a total of 500 roentgens of superficial irradiation and 75 mg. hours of radium shield therapy. The ulcer and residual hemangioma were completely removed in a single operation. B. shows the postoperative appearance eight months after treatment.**

*Pigmented Nevi*

The common mole and its variants constitute the second broad category of circumscribed neoplasms of congenital origin[13]. These are among the most common of all tumors of both childhood and adult life[14]. The exact origin of the pigmented nevus is still argued, but Masson's neurogenic and Allen's epidermal theories are the two most widely accepted concepts. Masson[15] feels that the nevus cell is derived basically from the tactile end organs of nervous tissue within the dermal and basal layers of the epidermis. The epidermal theory, however, suggests that these nevi arise from the basal layers of the skin by a process of "abtrophung" or dropping off of cells containing the enzyme melanogenase from the basal layer[16]. Space does not permit the presentation of the evidence in support of these theories, between which pathologists are about equally divided. Moreover, the argument is of academic interest only, since it does not influence the treatment.

The classification of pigmented nevi, as of the vascular, is largely pathologic, and it should be emphasized that the clinical appearance is deceiving and a very unreliable test. In general, they fall into five major groups: (1) the intradermal nevus, (2) the junctional nevus, (3) the compound nevus,

**Fig. 6. A large congenital hair-bearing pigmented nevus of the face in an 8 year old girl was removed in two separate stages by serial excision. The immediate postoperative photograph (C) is inserted to demonstrate the broken line camouflage type of plastic closure.**

(4) the blue nevus and (5) the juvenile melanoma. All these are present during childhood, but many, particularly in the group of junctional nevi, do not become apparent until the onset of puberty[16].

The *intradermal* or *the common mole*, may assume a variety of shapes, sizes, and colors. It occurs anywhere except on the palms of the hand, soles of the feet, scrotum, and vulva, and on histologic section it is found to be composed of masses or cords of regular nevus cells which contain varying amounts of pigment[13,17] (fig. 6).

*Junctional nevi* may occur almost anywhere, particularly on the hands, feet, and genitals. They may not become apparent until the onset of puberty, when they may appear quite suddenly, and in multiples. The junctional nevus varies markedly in size, shape, and degree of pigmentation. Clinically, it is not possible to distinguish a junctional nevus from a common mole expect in rare instances by its location. Histologically, it is composed of irregular masses of cells within the epidermis which have lost some degree of cohesion. Characteristically, this loss of cohesion is manifest by the formation of "clear cells" either within the epidermis or in the prolongations of the epidermis, such as the hair follicles and sebaceous glands. Although cellular arrangement is not orderly, the tumor is benign. The presence of junctional activity, however, may be the forebearer of malignant change[16].

The *compound nevus* is very common in the prepubertal child. Microscopically, it is an intradermal lesion with superimposed areas of junctional change. This tumor may appear singly, in groups, or as an extremely large lesion such as the bathing trunk nevus[14] (figs. 7 and 8).

The *blue nevus* is a rare benign tumor similar to the mongolion spot of childhood. It occurs about the face, dorsum of the hands and feet, and over the buttocks. Pathologically, the cells are spindle shaped. Unlike the mongolion spot, however, these blue nevi do not fade nor disappear[18].

The most interesting of all the pigmented nevi is the *juvenile melanoma*. This tumor occurs only in the prepubertal child and varies markedly in shape, size, and color[19]. Microscopically, it is identical with adult malignant melanoma; however, the clinical course does not correspond to the pathologic picture. Pack stated almost categorically that these are benign lesions which prior to the onset of puberty may grow, but only rarely undergo malignant degeneration[19b]. Spitz[19a], in reviewing 13 reported cases of malignant juvenile melanoma could find only one which was clinically malignant, and this was in a 12 year old girl. As malignant melanoma does occur in the prepubertal child, one should not be lulled into a sense of false security by the age of the patient (fig. 8).

Although quite rare, malignant melanoma is well known as an uncontrollable, vicious, and rapidly fatal tumor. Approximately 85 per cent of all cases arise in pre-existing pig-

mented nevi, particularly those of the junctional type which are situated in areas of chronic irritation. Clinically, the malignant change is characterized by rapid growth, increased pigmentation, inflammation, formation of satellite lesions, pain and ulceration[8,20].

*Method of treatment*

Numerous methods of treatment have been suggested, and many have been rejected as ineffectual and dangerous. Surgical excision is the treatment of choice. Pigmented nevi are not sensitive to any type of irradiation. The use of carbon dioxide snow and the sclerosing agents are valueless. Removal by electrolysis or the electrocautery is predictated upon the assumption that every lesion is benign. No pathologic proof of the benign or malignant nature of the lesion can be obtained, since the cellular structure is destroyed. Electrolysis and electrocoagulation may actually stimulate the growth and change of those nevus cells which escape electrocution and thus serve as a focus of malignant degeneration. This is due not only to the local effect of the procedure but also to the release of melanin, which is an irritant

**Fig. 7. A. A massive, slowly growing pigmented nevus of the cheek in a 10 month old infant was completely removed in four stages by serial excision. An interval of three months elapsed between stages (B, C, D). Final revision of the scar will be done when facial growth is complete.**

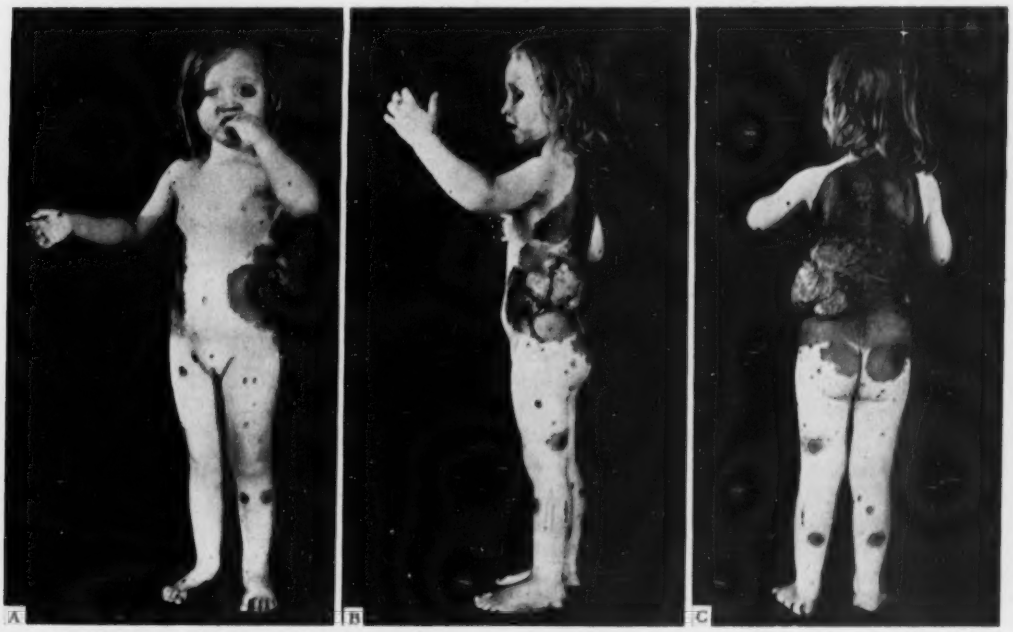

**Fig. 8. This 3 year old child was born with a large compound nevus of the back and flanks, which degenerated into a very rapidly growing melanosarcoma. The child succumbed six months following the onset of the malignant disease.**

strong enough to cause abnormal cellular reaction. Amadon reported 27 cases of malignant melanoma treated by electrocautery, with 27 recurrences. In all instances, there was evidence of distant metastases by the time local recurrence was manifest[21].

Surgical excision of pigmented nevi is the accepted treatment of choice. Pathologic evidence of the benign nature of the lesion and the adequacy of removal is proof positive of clinical safety. Malignancy does not occur in a mole which has been completely excised. The crux of the therapeutic problem, however, lies in the decision as to which nevi should be removed. Pack[14] stated that any pigmented lesion occurring in an area of chronic irritation such as the belt line or shave area, and all those occurring on the palms of the hand, soles of the feet, and genitals should be removed, for the best treatment of malignant melanoma is the prophylactic removal of its precursor.

Besides these, any pigmented lesion which shows evidence of change, such as growth, inflammation, increased pigmentation, and satellite nodules, should be widely removed immediately and a careful histologic examination carried out. The penalty for procrastination with malignant melanoma is uniformly fatal. The only possibility of cure lies in the immediate, surgical, "in continuity" dissection of the skin, subcutaneous tissue, fascia, and the regional lymphatic drainage[22]. Hutchinson[20c], in 1894, summarized the present approach to the treatment of pigmented nevi by saying: "It is surely quite needless to point out that the only proper treatment of an inflamed or irritated mole is immediate and free excision. On no account, should any temporizing measures be permitted. The patient's only chance of safety consists in excision of the whole thickness of the skin with a very wide margin. It is much to be desired that all members of the profession should have their minds fully alive to the features presented by these cases, and the terrible results of loss of time."

### *Summary and Conclusions*

The treatment of the vascular and pigmented nevus of childhood has been complicated by the number of methods currently in use. Too often a particular method of therapy is used without careful consideration of its contraindications, and the results may be disastrous. Irradiation therapy for vascular nevi should never be used near the orbits, over epiphyseal lines, tooth buds, and the genitals. Sclerosing solutions should not be used in an extensive tumor, because of the danger of reaction and slough.

Since it is impossible to distinguish clinically between the benign and malignant mole, any pigmented nevus which occurs in an area of chronic irritation or shows evidence of change should be removed surgically and a careful pathologic examination performed.

It is our feeling that surgical excision and plastic repair is the treatment of choice in both vascular and pigmented nevi.

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*Discussion*

**Dr. A. H. London, Jr.** (Durham): Do you treat the strawberry nevi?

**Dr. Masters:** We excise them in general. In the very young child they often disappear. I feel that after the age of 4 or 5 months, if there is not marked progression of the nevus, it will disappear spontaneously.

**Dr. London:** Most strawberry marks disappear in four or five years, don't they?

**Dr. Masters:** Some do. In the case of the smaller ones, I feel that it is safe to wait.

**Dr. London:** What about the ones which are as large as your thumb or those that are scattered over the body?

**Dr. Masters:** Those we remove because of the possibility of infection or ulceration. They can be removed at five years as well as at eight months.

**Dr. Robert B. Lawson** (Winston-Salem): I would like to comment on the question of spontaneous disappearance. Some will remember the paper given by Dr. John Rhinehart from the Department of Pediatrics at Bowman Gray. In following 100 cases of strawberry nevi, it was found that all were in the process of disappearing. None had grown after the age of 7 months. In our opinion there is a place for radiation and a place for surgery in the treatment, particularly of the small ones. We think that these are the ones to get rid of quite early. Regarding the large ones, fine judgment and careful following of the patient are required.

We believe that, if left alone, 99.44 per cent of these nevi will disappear at 4 or 5 years of age. None have been known to grow after 7 years of age.

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## A CLOSER LOOK AT THE ALCOHOLIC

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BUTNER

An ever broadening body of knowledge indicates that the causes of alcoholism lie in the physical, mental, and emotional aspects of the individual personality. Of these, the emotional structure, the pattern of life adjustment, and the traits of character are apparently most significant. Like our bodies, our personalities have a fairly well defined anatomy; and like our physical structure, our mental structure has an embryologic or developmental phase.

Space forbids a detailed discussion of the different theories of personality development. Using the psychoanalytic approach, however, I will attempt to describe the personality factors that appear to be relevant to the problem drinker. There is much that we do not know about personality. Regarding the alcoholic, the specific aspects of this question are even more obscure.

Read before the Second General Session, Medical Society of the State of North Carolina, Pinehurst, May 13, 1953.

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*Alcoholism Within Cultural Groups*

There are several cultural patterns that must be related to the occurrence of alcoholism within certain groups. From the vast body of information on that subject which has accumulated I want to point out one little sector— that relating to the Jewish culture.

We know that the occurrence of chronic alcoholism is rather low among the Jewish people. That fact, of course, is just as important, from our point of view, as is the high incidence in any other group. What significant facts about the Jewish people do we find besides the low incidence of alcoholism?

Turning to the much discussed topic of personality, one finds that there is a so-called oral phase. On this level of emotional development are conflicts and solutions to conflicts. If something goes wrong at a later stage of development, the person is liable to regress and gratify himself on the preceding level of adjustment—in this case, let us say, the oral phase.

What oral elements can be observed among the Jewish people? The absence of alcoholism might be one. The incidence of obesity and diabetes among them, however, is notably high. I think the official estimate of the differences between the Jewish and non-Jewish groups with regard to diabetes is somewhere in the ratio of 1 to 6 or 7.

Here is a sector of the population that apparently has about the same conflicts in the oral phase as does everyone else, and will probably experience the same frustrations in the later stages of personality development. In the presence of a neurotic process, however, instead of overdrinking the Jewish people tend to overeat. Since the connection between obesity and diabetes is quite well established, this may explain the deviation into obese diabetics. We are dealing here with a notably obscure picture, of which these are merely the vague outlines.

*Oral Elements in Alcoholism*

Let us now see what factors in the alcoholic group pertain to oral elements. Is there any evidence that overeating may be used as a substitute for overdrinking? A visitor to an AA club is amazed by the amount of Coca-Cola, together with sweets and coffee, being consumed. Moreover, members are advised in AA literature to keep some sort of candy or sweet at hand to eat

whenever the urge to drink comes. It is said that this device will cause the craving for alcohol to diminish, if not subside.

Another fruitful field of investigation is a typically alcoholic psychosis, such as delirium tremens. What type of hallucination is found in delirium tremens? Frequently encountered among the contents of these hallucinations is attack by animals, and as a rule by animals that attack by mouth, such as dogs, cats, snakes, and insects. I have never heard yet an alcoholic with delirium tremens describe a hallucination in which he was kicked by a horse. The means of attack in that case would be the foot. Hallucinations of attack by dogs, snakes, insects, and the like may be said to represent aggression by mouth—not the alcoholic's own mouth, but aggression on the part of the outside world coming almost exclusively by oral ways and means.

*Failure to Achieve Independence and Efforts to Compensate*

Let us now move from the oral to a higher level of development. After breathing, our first contact with the outside world is by the mouth — through the act of sucking. Sucking immediately suggests the mother and an awareness of dependency on the mother. This feeling of dependency undergoes a great number of conventional frustrations, as a consequence of which, and possibly as a defense against which, we start to develop independence, to get away from mother. This means leaving the oral plane and trying to operate on a higher level of development.

It is safe to say that in many cases of alcoholism, the patient has had some degree of difficulty in making this transition. The first formula was a feeling of security through dependency. This has to be changed to one of security through independence. The alcoholic, in most cases, is overdependent on his mother and stays so, for some reason, for a considerable length of time. If the feeling is too strong, he may try in some way to deal with it, to compensate for it. He may make a desperate attempt to be overindependent.

A review of a few hundred cases of alcoholism will disclose a great many instances of these two mechanisms — either a prolonged period of dependency or an early switch to patterns of extreme independence. Living by dreams of mother would mean too close an identification with her and her principles, her ideas, her criteria—in short, becoming too much like her. In a man this feeling may, at a very early age, be manifested in the fear of being a sissy. Discovery of this fear may lead to an attempt to be overly masculine. Hence the tremendous number of case histories of patients who became "sexual athletes" long before they touched their first alcoholic drink; and hence the rather pronounced promiscuous features of the alcoholic's early life, which I believe few people would deny.

*Promiscuity*

Note the difficulties some patients have in late adolescence with the "nice" type of girl. Back of it lie such ideas as: "I can't go with these girls; they are too much like my mother, and getting too close to my mother is dangerous." It is fairly obvious that the Oedipus complex has something to do with this difficulty. The patient reasons that his mother, perhaps through overprotectiveness and indulgence, has kept him too dependent on herself; consequently the type of personality which she represents has become intolerable to him. Because she makes him feel that he is a sissy or a baby, he turns to the promiscuous type of girl and acquires the characteristics which are so prevalent in the early history of alcoholism. Many adolescents turn to alcohol during this phase, in order to overcome their concern over girls in general.

I have already implied that overdependence on mother is resented—an important factor. This resentment is a form of aggression directed against the female figure. Since the first female figure in our life is the mother, it is in relation to her that the individual lays the foundations of his emotional structure. Furthermore, his relationship to her will be transferred to many aspects of his relationship with the female sex in general.

Let us turn to another alcoholic psychosis—alcoholic paranoia. In an overwhelming number of these cases the contents of the delusions or hallucinations are centered in the faithfulness of the wife. The mechanism, we think, is this: "I don't like women, I have had too many unpleasant experiences with them — first of all with my mother — so I cannot tolerate them. But if I cannot tolerate women, I will not be masculine but femi-

nine. Since I cannot tolerate being feminine I will try to be overmasculine.

"I have many promiscuous trends in myself. My wife, if I have one, is so much above me morally, that I am made to feel even lower; therefore, I will try to pull her down; I will project my promiscuity into her. I am no good, but neither is she. Since I cannot master myself, I must attack her. The most feasible means of attack is the projection of my promiscuity into her. This is the only tool I have, and it is close at hand. Perhaps I am too promiscuous to confess even to myself; but if I project this promiscuity into my wife, saying that she is unfaithful to me, my position will be raised, hers will be lowered. If, in my paranoid constructions, I make a prostitute of her, we will become closer to each other. Our incompatibility is an established fact. I have reverted all responsibility for this situation, however, by convincing myself that my promiscuity is nonexistent. By projection I have placed all the blame on her."

*Phallic Symbols*

To amplify the body of evidence, let us return to the hallucinations of the delirium tremens. Another frequent feature of such fantasies is attack by shooting. According to the psychoanalytic interpretation of dreams and the investigation of certain traits in different cultures, it seems evident that arrows, knives, and guns are used as phallic symbols. The delirious alcoholic says that he has been shot by someone or has a fear of being shot by someone, usually a man. According to the accepted symbolism, this represents a homosexual attack. The alcoholic says, in effect: "I may be a sissy, but I am not a homosexual. Someone who is a homosexual, however, wants me to be one; therefore he attacks me by shooting, knifing, etc. [phallic symbols]."

Even from this rather vague outline we can see what constructions any man — not just the alcoholic—can make with the difficulties originating in these spheres—the oral and the genital; and we can see also the many possible methods of compensation he may use. While we take into consideration the general psychologic point of view, however, we must add that the aforementioned mechanisms are so typical of the alcoholic that many features of alcoholism can be easily explained by these same elements.

*Marital Conflicts*

Perhaps the individual is fairly well balanced until he gets married. Trouble may strike only when he tries to adjust to his new situation. It is not necessary to go into the difficulties encountered in the marriage of an alcoholic. I have heard one very good student of alcoholism say: "How could you expect a woman who has been through so much trouble for 12 to 15 years because of her husband not to be neurotic and decompensated?" I believe this to be true, but not the whole truth. I have observed that in the majority of these marriages the personality of the wife is preponderantly maternal. From what has already been said, it is not difficult to see why the man who has had early trouble with his mother and who has passed through a rather stormy adolescence will try to find a mother in his wife. In many cases the wives are older than their husband —another indication of maternalism. Whatever the man's need to marry a "mother," he would not succeed without the consent of someone who was herself inclined to assume the role of mother. This brings us to the personality of the wife of the alcoholic, which in some respects seems to be as neurotic as that of the alcoholic.

This man who is inadequately masculine underneath marries a woman who is feminine in only one way—the maternal. Her maternalism is probably her only defense against her inadequate femininity. What happens when they try to live together in marriage? There is growing discord as the man resents anything which does not satisfy his need of masculinity, while the wife does just the opposite. Slowly they drift apart. In studying the wives of alcoholics, it is interesting to find that in many cases they divorce one man because of his drinking only to marry another known alcoholic. I have in my records cases in which a woman has married five alcoholics in this style. Two or three such marriages on the part of a woman is not rare.

The marital conflict of an alcoholic originates in his psychodynamic structure as well as in the psychodynamic structure of the wife. If he does not reach the level of deciding to marry and trying to make an adjustment, he probably remains a bachelor; becomes a homeless man, the drifter, whose only sexual contacts are with prostitutes. In

such contacts, he will never find satisfaction or complete sexual identification.

*Addicts of Success*

Another burning problem apparently originates, to some extent at least, in these same difficulties. "How can I prove to myself that I am a man?" Because of an example which they had before them when they were young, many men find in work their only compensation for not being enough of a man. They work and work and make money. Such people are well known. They might be called addicts of success just as sexual athletes are called addicts of sex. Both represent forms of addiction. The success addict works, not because he wants to work, but because he cannot live without working. He is compelled by a force which is beyond his will power; which is beyond conscious estimation and measuring. He works on account of these deep-seated pressures. He cannot relax. He tries to, especially after he has reached the peak. He may say, "A few drinks will probably help me." And I have no doubt that they do.

The man who is addicted to success, who is pushed towards success, cannot relax without resorting to artificial means. No wonder that he becomes addicted to the relaxant, to the depressant. Since his values are usually much higher, he may not be able to tolerate the end effects of alcohol. Accordingly, he finds a measure of compensation as soon as the first bout has taken place, then, after three months, six months, two years, three years, when enough pressure has been built up again, he will revert to alcohol. I believe that in this form of speculation we may find at least some explanation of the debated and difficult question of the periodic drinker.

*Drunken Behavior as a Clue to Inner Conflict*

According to those who like to think of personality disturbances or character deviations in dynamic terms, the alcoholic, because of his faulty personality development, suffers from a neurotic discomfort. There are signs of desperate attempts to compensate for these discomforts in the form of certain character defenses. When, at a certain age, these defenses for some reason start to break down, the alcoholic candidate changes from total abstinence or social drinking to addictive drinking. He then reaches for the drug to anesthetize his personality discomfort. The emotional immaturity of the addictive drinker and the scrambled character structure which results from it, plus the pharmacologic aspect of alcohol, precludes further emotional growth. In fact, the action of alcohol enhances regression. Alcohol, in this respect, meets the regressive needs of any neurotic, particularly the character neurotic. Speaking in figurative terms, the alcoholic, when intoxicated, is operating on an infantile level, whereas, when sober, he is a very uncomfortable child in an adult body and in an adult world.

Taking this fundamental principle into account, I would point to the relatively neglected significance of the drunken behavior of the alcoholic. According to Strecker, it is almost always possible to detect in this behavior a nucleus which indicates the focal conflict of the individual and his immediate and most primitive defenses against it. Thus the "crying drunk" appears to represent the "lost child"; the intoxicated sexual athlete is trying to compensate in a pseudo-masculine way with frequent heterosexual contacts for his vague awareness of predominantly feminine identification; the fighting drunk reflects the conflict with figures of authority, usually originating in early conflicts with the father.

*Conclusion*

No matter how sketchy this presentation may be, if it enables the physician to take a closer look at the alcoholic, our patient already has been benefited.

The author is indebted to Dr. David A. Young, General Superintendent, North Carolina Hospitals Board of Control, for permission to publish this paper. Neither Dr. Young nor the Board of Control has any responsibility for any fact or opinion expressed.

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**In these ways and others the full tide of human needs and change bears down daily upon the medical man.** These demands must be met in the course of activity with little chance for reflection to plot strategy. For Medicine abhors spare hours like nature a vacuum. It seems that with the continuing evolution of medical practice every physician, like the Red Queen in "Alice Through the Looking Glass," has to keep running if he is not to lose ground. It is little wonder that in a mood of weariness many a physician echoes the words of old Doctor Pycroft: "When I die I shall have a bell hung on my headstone with an inscription asking the compassionate passer-by to ring it loud and long. And I shall not get up."—Scarlett, E. P.: By Apollo, Canad. M.A.J. 69:325 (Sept.) 1953.

# BOECK'S SARCOID AS IT AFFECTS THE EYE

ALFRED N. COSTNER, M.D.*

DURHAM

Sarcoidosis, while not a common cause of eye disease, is certainly not a rare one. Woods and Guyton[1] studied 200 consecutive cases of uveitis at the Johns Hopkins Hospital, and found sarcoid as an etiologic agent in 7.5 per cent. As more and more contributions have appeared in the literature in recent years, the disease has become better understood and more readily recognized, and its importance may very well grow in the future.

## *History*

The history of this disease is not only interesting, but also helpful in understanding the different names attached to what is most commonly known as Boeck's sarcoid, or sarcoidosis. The first reported case of the disease was probably in 1875 by Jonathan Hutchinson, who described a skin disease in a patient by the name of Mortimer and called it "Mortimer's malady."[2] In 1889 Bésnier, a French dermatologist, reported a similar condition which he thought was related to tuberculosis and which he called lupus pernio. In 1899 Caesar Boeck, a Norwegian dermatologist, reported a case with skin lesions and enlarged lymph nodes, calling this "multiple benign sarcoid." This report was accompanied by pathologic studies of a skin specimen. In 1909 Heerfordt described a disease characterized by uveitis, parotitis and fever, calling it uveo-parotid fever. This was later shown to be a manifestation of sarcoidosis.

Some order was brought into the picture in 1914 when Schaumann studied three autopsies of lupus pernio and one of sarcoid. He established the fact that they represented the same disease process and reported a complete pathologic study of the disease. Since that time many articles have been contributed by internists, pathologists, radiologists, dermatologists, and ophthalmologists to the literature on Boeck's sarcoid, or Bésnier-Boeck-Schaumann disease.

Read before the Section on Ophthalmology and Otolaryngology, Medical Society of the State of North Carolina, Pinehurst, May 12, 1953.

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**Fig. 1. Negro man with bilateral granulomatous uveitis and interstitial keratitis, due to sarcoidosis.**

## *Diagnosis*

Sarcoid is now recognized as a systemic disease, and the granulomatous lesions may be found in almost all body tissues. Our interest as ophthalomologists is great, not only because the eye is one of the favorite organs that sarcoid attacks, but also because ocular symptoms not infrequently are among the first to cause the patient to seek medical care. The etiologic survey in a patient with uveitis is frequently disappointing; however, when a young individual, particularly of the Negro race, presents himself with a bilateral granulomatous uveitis, we may be highly suspicious of sarcoidosis. Figure 1 shows a picture of a Negro with chronic granulomatous uveitis, and interstitial keratitis. If such an eye lesion is due to sarcoid, the tuberculin skin sensitivity test will be negative in the majority of cases. The Wassermann test, Brucella agglutinations tests and complement fixation tests for toxoplasmosis likewise will be negative. The picture is not that of a sympathetic ophthalmia, and we are left with a diagnosis of granulomatous uveitis, most likely due to sarcoid. Dental and sinus roentgenograms are negative. The chest roentgenogram frequently shows a picture similar to that shown in figure 2, the lungs being very commonly involved. The typical pulmonary manifestation is that of enlarged hilar lymph nodes.

On further examination of the patient, the leucocyte count is likely found to be normal, with an essentially normal differential count. The hemoglobin and red blood cell count are normal or slightly low. The sedimentation rate is usually, but not always slightly elevated. Blood chemistry studies frequently

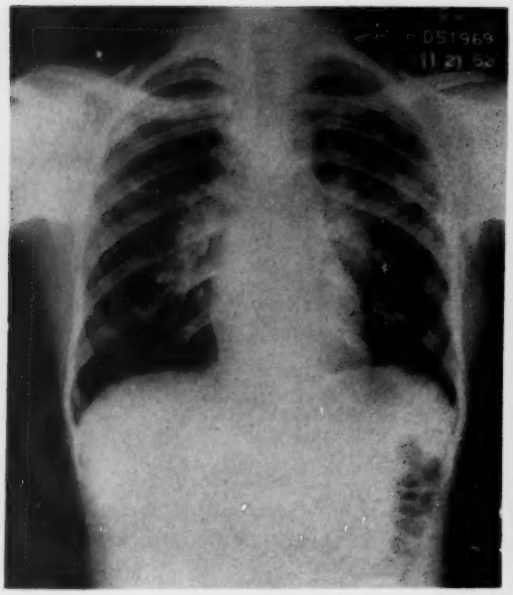

Fig. 2. Chest roentgenogram of sarcoid patient, showing enlarged hilar lymph nodes.

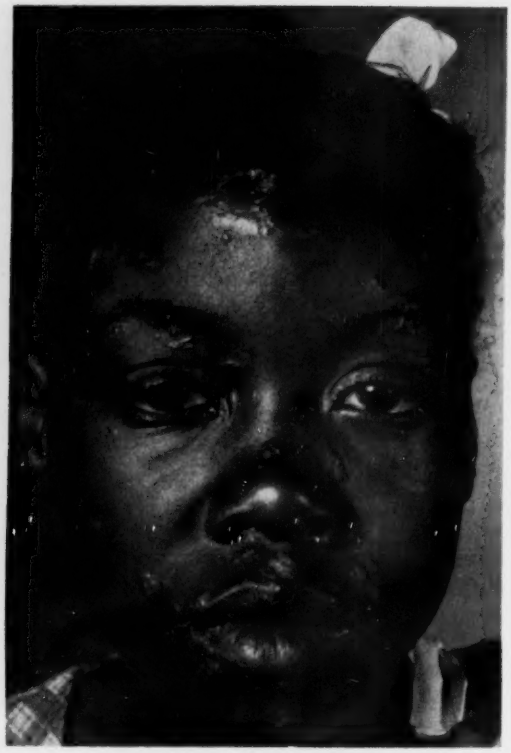

Fig. 3. Negro girl showing sarcoid lesions of the skin.

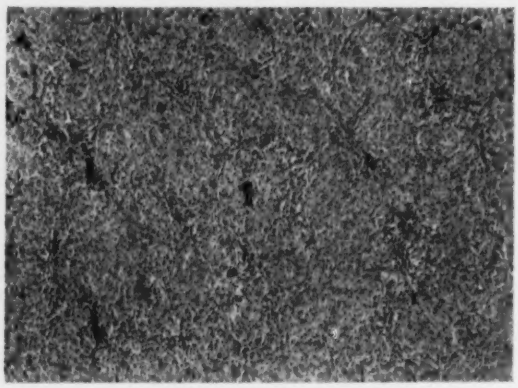

Fig. 4. Microscopic section taken from sarcoid granuloma of the eye.

show an elevated blood calcium, with a normal phosphorus. The serum globulin is frequently elevated, resulting in a reversal of the albumin-globulin ratio. These accessory clinical findings help confirm the diagnosis of sarcoidosis, which is not complete, however, without a biopsy. Lymph nodes are frequently enlarged in sarcoid patients, and peripheral nodes are usually accessible for histologic studies. In other patients, biopsy of skin lesions may be carried out, as the skin may show involvement (fig. 3). To summarize, a granulomatous uveitis with negative tuberculin sensitivity, roentgen disclosure of enlarged hilar lymph nodes, elevated blood calcium and serum globulin levels, with a reversal of the albumin-globulin ratio is highly suggestive of sarcoidosis. Histologic examination of a peripheral lymph node establishes the diagnosis with certainty.

Figure 4 shows a microscopic section from an eye that was removed because of a large sarcoid granuloma. The characteristic lesion is that of a hard tubercle with epithelioid cells and giant cells, but no caseation. This pathologic picture is said to be produced with "monotonous regularity" in the tissues of sarcoid patients. The similarity to tuberculosis is immediately apparent; however, there is no caseation in the sarcoid lesion, and smears, cultures and guinea pig inoculations are all negative for tubercle bacilli.

*Ophthalmologic Aspects*

Sarcoidosis is frequently described as a benign disease; in fact, one of its early names was benign lymphogranulomatosis. However, as far as the eye is concerned, sarcoid is not a benign disease. In two-thirds

of the cases in our series, the vision was reduced to a level of 20/200 or less in at least one eye and frequently in both eyes. This represents an appreciable loss of vision if unilateral, and an incapacitating loss if bilateral. The visual loss is usually due to corneal opacification resulting from interstitial keratitis, which many of the patients have. Granulomatous uveitis is the most common eye manifestation, closely followed by deep keratitis, and the loss of vision is usually due to one of these conditions or to a complication of them. Other less common manifestations are lacrimal gland involvement and facial paralysis. The latter usually accompanies uveoparotid fever. The skin lesions may involve the eyelids, as we have already seen.

The course of the eye disease is characterized by chronicity and by resistance to the usual forms of therapy. It does not cause a toxic reaction in the patient, who may feel extremely well in spite of widespread sarcoid lesions. Likewise there may be little pain in the eye in spite of extensive ocular involvement, unless secondary glaucoma supervenes. In the eye, however, the mere mechanical presence of the resultant scar tissue is the destructive factor as far as visual function is concerned. Our studies confirm the impression of others that sarcoid is largely a disease of children and young adults, and is more common in the colored race.

*Treatment*

Although there is much discussion as to the etiology of sarcoid, it must be stated that the cause is still unknown. Whether the disease is due to the tubercle bacillus or not is still argued in some quarters. Without knowing the etiology, it is not surprising that we have no satisfactory form of treatment. Many methods have been tried, from the arsenic of Boeck to present day therapy with ACTH or cortisone. ACTH in the form of intravenous infusions seems to be the treatment of choice at this time, and apparently helps cases of sarcoid uveitis. In our experience it has been particularly helpful in controlling the tension of those cases of uveitis complicated by secondary glaucoma. It is not completely successful, however, and may be replaced with other forms of therapy as the disease becomes better understood.

*Summary*

This paper has attempted to summarize what is known of Boeck's sarcoid, with particular emphasis on the ocular aspects of the disease. It points out that bilateral granulomatous uveitis and interstitial keratitis in a young Negro with a negative Wassermann test is strongly suggestive of Boeck's sarcoid. Enlarged hilar lymph nodes on roentgen examination of the chest, elevated blood calcium and serum globulin with reversal of the albumin-globulin ratio, and a positive histologic examination of tissue confirm the diagnosis. The disease is usually benign from the systemic viewpoint, but may be quite destructive of vision. The etiology is unknown and present treatment is not completely satisfactory.

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## THE HISTORY OF THE BUNCOMBE COUNTY MEDICAL LIBRARY

LOUISE M. FARR*

ASHEVILLE

The library of the Buncombe County Medical Society, which is now permanently housed in a brick building on the grounds of the new Memorial Mission Hospital, was 18 years old on June 1, 1953. There are approximately 10,000 bound and 10,000 unbound volumes shelved in the reading room, the stack room, and the auditorium. The library receives 138 journals and bulletins by gift and subscription.

*Beginnings*

This library came into existence in 1935, largely through the efforts of Dr. Julian Moore. Because of his untiring energy, his love of books, and his realization of the importance of a medical library as an instrument of medical progress, this library was established.

On February 4, 1935, Dr. Roy McKnight, director of the Charlotte Medical Library, addressed the Buncombe County Medical Society. He gave such a stimulating talk on the successful operation of the Charlotte

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Medical Library that a committee was appointed to work out a plan similar to the one in operation at Charlotte, which provided for a combination library and physician's exchange. Dr. Moore was elected chairman. Serving with him were Dr. A. B. Craddock, Dr. Eugene Carr, Dr. Paul Ringer, and Dr. Curtis Crump. The plan for a library combined with a physician's exchange did not materialize. The Medical Society then voted for the committee to organize a library association.

The committee met with a group of interested physicians, on April 25, 1935, to elect a board of directors and to adopt a constitution. The constitution was drawn up, naming the organization the Asheville Medical Library. Seven men were elected to the board of directors: Dr. Julian Moore, chairman, Dr. Paul Ringer, Dr. A. B. Craddock, Dr. Walter Johnson, Dr. Edward Schoenheit, and Dr. J. A. Sinclair, dentist.

In the beginning only 50 members of the Buncombe County Medical Society agreed to join the association and pay dues of 25 dollars a year. A room was rented in the Grove Arcade to house the library. Miss Louise Mashburn, a trained librarian, was employed on June 1, 1935. Shelves were built and books and journals were donated. By July, the library was open four hours a day, six days a week.

The library became a member of the Medical Library Association. Two thousand, five hundred volumes were on the shelves at the end of the year, and 120 medical journals and bulletins were coming in regularly by gift and subscription. The directors felt that the first year had been successful. In four more years, the library outgrew its quarters and moved to a larger space in the same building, where the Society meetings were held.

In January, 1936, the Buncombe County Medical Society voted to take over the Asheville Medical Library and to change the name to the Buncombe County Medical Library.

In 1944, Dr. Louise Perry gave five hundred dollars with which to start an endowment fund. To this fund Dr. B. O. Edwards and Dr. Julian Moore, retiring and incoming presidents of the Medical Society, also contributed one hundred dollars each. In order to receive donations for an endowment fund, the library had to be incorporated. The papers were signed July 16, 1945, and Dr. Moore was elected president of the corporation.

*Changes in Personnel and Location*

After the resignation of Miss Mashburn (now Mrs. George Farr) in 1939, there were frequent changes of librarians and locations of the library. When the Postal Accounts took over the Arcade Building in 1942, the library was moved to the City Hall. Just about the time it was comfortably located, a branch of the Army Air Force took over the City Hall, and the library was forced to move again. Its next home was the floor above Goode's Drug Store, where it remained until 1949, when the drug store was put up for sale, and the library was again moved to the City Hall.

Shortly afterward, the then librarian, Miss Hattie McKay, resigned, and for the next two years the library was in a state of chaos, with untrained personnel in charge. Auxiliary to the Buncombe County Medical Society worked with devotion during this period, organizing the books and journals. About the time the shelves were in order, the library board made an agreement with the Board of Trustees of Memorial Mission Hospital to move the library into a two story brick building on the grounds of the new hospital. In this building was also a suitable meeting place for the Society. The hospital board agreed to maintain the building, and, upon completion of the hospital, to pay the salary of a qualified librarian. In return the Buncombe County Medical Society agreed: (1) to give $1,200 annually for binding journals; (2) to have two members of the Memorial Mission Hospital Board appointed to the library board; (3) and to make the library available, without cost, to all licensed physicians, dentists, nurses, students, and other persons conforming to rules established by the library board.

When the agreement was signed in December, 1951, the Buncombe County Medical Library was moved to its permanent home on the grounds of the new hospital. There it was combined with the Norburn Medical Library, a collection of several thousand volumes given by Dr. Charles Norburn. Combined with the Norburn Medical Library, the Buncombe County Medical Library has probably become one of the largest county medical society libraries, not affiliated with a teaching institution, in the South.

*Friends of the Library*

The numerous transfers of the Buncombe County Library have cost a total sum of $1,900. Despite the difficulties of the war years, when so many members were in service, the library continued to grow and function. Throughout these turbulent years, Dr. Moore kept the Society interested in the struggling organization.

Dr. Moore served as president of the library corporation until 1950, when Dr. Curtis Crump succeeded him. From the time of its organization, Dr. Crump has labored diligently to advance the best interests of the library, contributing freely of his time, his books, and his journals. Under his scholarly and dedicated leadership, the future progress of the library is assured.

In the beginning members contributed most of the books and journals. Dr. Moore gave the first books ever donated to the library—a set of *Cyclopedia of Medicine*—and helped the librarian carry them in. Dr. Moore also gave the last 20 volumes of most of the surgical journals. Dr. Edward Schoenheit gave valuable volumes of the *Lancet*, the *Journal of the American Medical Association*, *American Review of Tuberculosis*, and the *Archives of Internal Medicine*, from the library of Dr. Silvio Von Ruck. Generous gifts also came from Dr. Walter Johnson, Dr. H. H. Briggs, Dr. C. C. Orr, Dr. Louise Ingersol, and others.

Private libraries of many doctors have been willed to the Buncombe County Medical Library. Among them were the libraries of Dr. C. H. Cocke, Dr. Wilson Pendelton, Dr. Paul Ringer, Dr. A. B. Craddock, and Dr. LaBruce Ward.

As the writer, who resumed the librarianship in November, 1952, consults the books given by individual physicians, she finds in their marginal notations friendly reminders of their many personalities. Along the walls of the library hang portraits of the men who made this enterprise possible—in tribute of their earnest desire to further the progress of medicine.

*Continued Growth*

The completion of the files of 40 medical journals was made possible by the early files of the library, by gifts from the Medical Library Exchange, and by the use of a "want list" on which are entered the titles and missing numbers of those journals needed to complete the files. By carrying this list around with her, on her travels in this country and Europe, the librarian has managed at small expense to bring back the journals, or arrange to have them mailed to the library. By exchanging the *Southern Medical Journal* and the *North Carolina Medical Journal* with other libraries, she has acquired several state journals.

The library has a current catalogue of the books and journals in the Veteran's Administration Hospital at Oteen and Swannanoa. An inter-library loan service among these libraries has been established, and takes care of the majority of requests from patrons.

The library has the nucleus of a good collection on medical history. Dr. Ben Meriwether contributed his father's books to this collection. Other volumes once belonged to Dr. C. H. Cocke, Dr. Paul Ringer, Dr. Charles Minor, Dr. Norman Anderson, Dr. Charles Norburn, and Dr. Curtis Crump.

The Buncombe County Medical Library has served as a source of information for doctors, nurses, students, lawyers, teachers, ministers, ghost writers, FBI agents, and authors. It was here that Carl Sandburg spent many hours pouring over old books and journals to learn how much was known about plastic surgery in the 1860's, in his research for *Remembrance Rock*.

When the new Memorial Mission Hospital is completed, the library will be the scene of increased activity, serving students, nurses, interns, and physicians of the Buncombe County Medical Society. Because of their heritage from medical research, these patrons of the Buncombe County Medical Library will surpass their predecessors in scientific knowledge. As Roger Bacon said six hundred years ago, "In matters of learning the youngest are in reality the oldest."

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**Family doctor:** There are probably no words which can explain the deep and abiding trust and affection that has existed and sometimes exists today between the family doctor and his patients. This ephemeral quality has been and probably will continue to be the greatest reward for the physician. We believe that young men should be taught that their greatest opportunity to serve the public lies in this field of general practice and the family doctor relationship.—Williamson, P.: The Field of General Practice, New Orleans M.&S. J. 104:765 (Dec.) 1952.

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"The prime object of the medical profession is to render service to humanity; reward or financial gain is a subordinate consideration. Whoever chooses this profession assumes the obligation to conduct himself in accord with its ideals."—Principles of Medical Ethics of the American Medical Association, Chapter 1, Section 1.

FEBRUARY, 1954

## THE CENTENNIAL MEETING

The next meeting of the Medical Society of the State of North Carolina, to be held in Pinehurst May 3, 4, and 5, will be a historic event. It will mark the one hundredth annual session of the Society, and will be recognized as the centennial celebration.

A natural question which arises concerns the apparent regression in the age of the Society since the 1949 meeting, which was proclaimed as the one hundred and fiftieth anniversary. The answer is that, while the first recorded meeting of the State Medical Society was held in 1799, no regular records were kept until 1854, and apparently the meetings prior to that date were held at sporadic intervals. Since 1854, however, the Society has met regularly except for interludes during the Civil War and the second World War. For that reason, 1954 really marks the one hundredth anniversary of the Society as a going concern.

President Joseph Elliott has appointed a special committee to plan for this meeting. This committee has met formally, and has given much time and thought to planning for a really historic event, with various exhibits to mark the progress of medicine during the last one hundred years. The 1954 meeting is expected to break all records for attendance, and those who attend it should be well repaid for their efforts. While rooms at the headquarters Carolina Hotel at Pinehurst will be hard to obtain, accomodations are available in a number of other good inns within easy reach of the hotel. Plan now to attend this centennial meeting, and to enjoy the good program and the good fellowship that will mark this occasion.

* * *

## CIGARETTE MANUFACTURERS ON THE DEFENSIVE

Members of the older generation recall that when cigarettes first appeared on the scene, they were popularly known as "coffin nails." Dire predictions were made as to the ultimate fate of cigarette smokers. About the turn of the century a famous preacher, who also held an M.D. degree, declared publicly that anyone who would smoke cigarettes regularly for ten consecutive years would drink, lie, steal and be guilty of all manner of immorality. A well known system of medicine said of tobacco:

> A long continued heavy use of tobacco produces . . . indigestion, anorexia, cardiac irregularity and palpitation . . . deafness, headache, giddiness, tremors, and other nervous symptoms . . . The eye loses its vision for colors and complete blindness may result. The testicles atrophy and become discolored, and the ovary of the female habitue shrivels into a small kernel, hard and yellow.

Many other equally rabid statements were made. In a valiant effort to save their sons from the dire consequences of smoking cigarettes, a number of women joined hands to form the "Anti-Cigarette League." In some states the sale of cigarettes was forbidden by law, although pipes and cigars were tolerated.

Gradually the furor abated. Many lost their long-standing prejudice against cigarettes, and finally women began to adopt the

habit. The sale of cigarettes mounted to astronomical figures.

Recently, however, the public is being made increasingly suspicious that there is danger in the paper-bound editions of the weed. At first the statistical studies made to link cigarettes with lung cancer were ignored, although made by honest scientists. Then the tobacco industry as a whole made its greatest blunder when different companies began advertising that their particular brands might be smoked with impunity because of some special manufacturing process. The inference was all too plain—that other brands carried insidious danger. When, however, a television or radio commercial advertising brand A's safety factors was followed by the claims of B, C, and D that they alone had the secret of safety, listeners naturally began to suspect them all. The slogan, "A Treat Instead of a Treatment," reminded many that the same brand not long ago had boasted that there was "Not a Cough in a Carload." When another company advertised that a certain preparation used in its manufacturing process took the fear out of smoking, some doctors recalled that this same preparation was the solvent used in a notorious sulfanilamide elixir, which caused the death of more than 70 victims. One manufacturer's claim that his filter removed toxic materials from the tobacco is met by another's that his tobaccos are so pure that no filter is needed—and so forth, *ad nauseam*.

Now that not only medical journals but such pseudo-scientific publications as *Reader's Digest*, *Time*, *Coronet*, and *Pageant* are adding to the fear of cigarette smoking and sales of cigarettes are falling off, the tobacco manufacturers are finally waking up to the fact that more than paid T.V. and radio commercials are needed to combat the public fear.

This journal is naturally vulnerable to a criticism of being biased, since North Carolina is one of the principal tobacco-growing and tobacco-manufacturing states in the Union. Nevertheless, it is pertinent to point out that there are many other factors to be considered before branding the cigarette as the chief villain in the increase of lung cancer. Dr. W. C. Hueper of the National Cancer Institute at Bethesda, who could not be considered a biased observer, stated in a recent issue of *Industrial Medicine and Surgery*[1]:

> It may be concluded that the existing evidence neither proves nor strongly indicates that tobacco smoking, and especially cigarette smoking, represents a major or even predominating causal factor in the production of cancers of the respiratory tract . . . If excessive smoking actually plays a role in the production of lung cancer, it seems to be a minor one if judged from the evidence on hand.

Whether or not, however, there is real cause for the cigarette smoker to fear the ultimate result of his habit, a serious doubt has been raised in the minds of many smokers and potential smokers. It is to be hoped that the tobacco manufacturers will not shut their eyes to the problem that faces them, and that something constructive will be done to overcome the growing suspicion of cigarettes. This can be accomplished only by assuring the public (1) that unbiased scientific research will be done in order to discover what, if any, carcinogenic substances are present in cigarette smoke, and (2) that if any carcinogen or carcinogens are found, steps will be taken at once to get rid of the offending material. By joining hands in intensive research conducted by competent scientists whose reputation is not for sale, the great tobacco industry may hope to regain public confidence. It will be necessary, however, for all the major companies to cooperate in this enterprise, and to abandon the fear-inspiring type of advertising which has been followed far too long.

1. Hueper, W. C.: Lung Cancer and the Tobacco Smoking Habit, Industrial Med. Surg. 23:13-19 (Jan.) 1954.

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## NORTH CAROLINA HONORED BY BORDEN

North Carolina, which has become accustomed to being selected as a pilot state, is honored once more, this time by the Borden Company. In a series of test advertisements appearing in the NORTH CAROLINA MEDICAL JOURNAL, the Company's Prescription Products Division salutes the medical profession in selected North Carolina cities. On the basis of the response to these advertisements, the Company has decided to extend the campaign.

This JOURNAL, one of four state journals selected for the test, is pleased to participate in the series, details of which will be found on page 98 of this issue.

## THE EIGHTH DISTRICT GENERAL PRACTICE SEMINAR

Anyone who has attended a few meetings arranged by the Academy of General Practice—whether national, state, or district—cannot fail to be impressed by their value. The programs are always good. The speakers are selected with discrimination, and most striking of all, the audience is attentive throughout the whole program. There is not the constant moving in and out that mars so many medical gatherings.

The recent seminar on diabetes of the Eighth District, held in Winston-Salem on January 24, met the usual high standards of G. P. meetings everywhere. Considering the snow which blanketed the whole state over the week-end, the attendance was surprisingly good, and interest was sustained throughout. After the opening remarks by the president, Dr. Wayne J. Benton, and the eighth district director, Dr. W. J. May, the following panel of eleven men discussed various aspects of diabetes: Dr. Amos Johnson of Garland, Dr. Donald Morris of City Memorial Hospital, Winston-Salem; and Drs. W. M. Kelsey, Frank Lock, Paul W. Johnson, Felda Hightower, Winston Roberts, Robert McMillan, George James, Richard L. Masland, and J. C. P. Fearrington of Bowman Gray.

Special mention is due the firm of Wyeth, Inc., for sponsoring the program and paying all expenses connected with it. No doubt Wyeth's representatives will be given a more cordial welcome by general practitioners everywhere because of this hospitality. Many present commented on the effectiveness of this form of advertising as compared with expensive brochures distributed by mail.

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## THE OUTLOOK FOR MEDICINE

Never has the outlook for the profession been brighter. Everywhere the physician is better trained and better equipped than he was twenty-five years ago. Disease is understood more thoroughly, studied more carefully and treated more skillfully. The average sum of human suffering has been reduced in a way to make the angels rejoice. Diseases familiar to our fathers and grandfathers have disappeared, the death rate from others is falling to the vanishing point, and public health measures have lessened the sorrows and brightened the lives of millions. The vagaries and whims, lay and medical, may neither have diminished in number nor lessened in their capacity to distress the faint-hearted who do not appreciate that to the end of time people must imagine vain things, but they are dwarfed by comparison with the colossal advances of the past fifty years[1].

The reader who does not recognize the source of the above quotation might well think that it was used in a recent review of medical progress. It was first written, however, by the late Sir William Osler in 1902. It is to the credit of the medical progression —and to science in general — that these words are more appropriate now, and that with reasonable confidence we may expect them to hold true when the twenty-first century begins.

1. Osler, W.: Chauvinism in Medicine, in Acquanimitas with Other Addresses, ed. 2, Blakiston, Philadelphia, 1930, pp. 283-284.

* * *

## HOSPITAL CONSULTATION

The Joint Commission on Accreditation of Hospitals is composed of representatives from the American College of Physicians, the American College of Surgeons, the American Hospital Association, the American Medical Association, and the Canadian Medical Association. At its annual meeting, held on December 5 in Chicago, the following recommendation from a special committee on "Consultation" Standard was approved by the Board of Commissioners:

> Except in emergency, consultation with a member of the Consulting or of the Active medical staff shall be required in all major cases in which the patient is not a good risk, or in which the diagnosis is obscure, and in all first caesarean sections, sterilizations, curettages or other operations which may interrupt a known, suspected, or possible pregnancy. The consultant shall make and sign a record of his findings and recommendations in every such case. In all cases where a rule of the hospital requires consultation, the consultant may, and in case of free patients shall, give his services without charge. This Standard is applicable to all members of the medical staff.

The Committee on Consultations was asked to continue its study and report again after July 1, 1954. "The Committee would appreciate comments or suggestions from any interested individual or group as to the Standard on Consultations as stated in this Bulletin which, since the Board action of December 5, should be followed by hospitals and their medical staffs."

Any individual or any hospital staff wishing to offer recommendations should communicate with a member of the committee, which is composed of Dr. Newell W. Philpott, Royal Victoria Hospital, Montreal; Dr. Alexander M. Burgess, 107 Bowen Street, Providence 6, Rhode Island, and Dr. Stanley R. Truman, 1904 Franklin Street, Oakland, California.

# Committees and Organizations

## ANESTHESIA STUDY COMMISSION

### POSTOPERATIVE CARE

BEN C. OGLE, M.D.
RALEIGH

Ideally, at the completion of a surgical procedure the patient is in such condition that no special attention, nursing or medical, is needed to assure his complete and uneventful recovery from the effects of the anesthetic he has received. His central nervous system has recovered function to the degree that he is at least semi-conscious (that is, he will make an appropriate response to a simple command); his throat reflexes are active and he will resist interference with the patency of his upper airway; his cough reflex is active and secretions in his trachea and bronchi are actively expelled; the neuromuscular mechanism effecting ventilation of his lungs is sufficiently recovered so that the volume of pulmonary ventilation is kept at a level appropriate to his metabolic requirements; his circulating blood volume is near normal, losses of blood in excess of that well tolerated having already been replaced; and the tone of his blood vessels is returning so that his arterial blood pressure is well maintained.

More often than not (under present conditions) this ideal situation does not prevail—the anesthetic state and the abnormalities accompanying it persist for a varying length of time into the postoperative period. Special precautions must then be taken lest complications arising out of this state of affairs jeopardize the patient's recovery.

#### *Respiratory Complications*

The most frequent complication to arise is that of obstruction of the upper airway. Relaxation of the jaw muscles, allowing the tongue to fall against the posterior pharnygeal wall, and the accumulation of mucous secretions and blood in the pharynx are the most common causes of upper respiratory tract obstruction. Until the patient has regained the ability to guard the patency of his airway, it is necessary that he be attended constantly by someone who is able to detect promptly the occurrence of respiratory obstruction and to take appropriate remedial measures. These measures consist of elevation of the jaw manually or by means of a mechanical airway, oral or nasal, and the aspiration of foreign matter from the pharynx. Mechanical means for aspiration of the pharynx must, of course, be readily available. The lateral position with head low, the so-called post-tonsillectomy position, is helpful both as a preventive and corrective measure for obstruction of the upper airway.

Gastric contents are occasionally vomited or regurgitated into the pharynx postoperatively and there cause respiratory obstruction. This situation is best managed too by mechanical removal of the material, and the lateral or head down position.

Obstruction of the lower airway results most frequently from the accumulation of secretions (or in suppurative lung disease, purulent material) in the absence of an active cough reflex. It is detected by the usual signs of respiratory insufficiency, plus uneven expansion of the chest on visual examination, or unequal or absent breath sounds on auscultation. Coarse rhonchi are frequently detected. Mechanical removal of the obstructing material will quickly correct this situation, and this is readily accomplished by passing a no. 16 Fr. catheter into the trachea and aspirating the offending material. The catheter may usually be passed blindly without too much difficulty. Failing this, the larynx may be visualized through a laryngoscope, and the catheter passed under direct vision. Rarely is bronchoscopic aspiration necessary. Doctors performing surgery should familiarize themselves with the technique for blind catheterization of the trachea. It is a simple procedure, but one which can prove very helpful.

Inefficient functioning of the neuromuscular apparatus for pulmonary ventilation may lead to oxgen lack and carbon dioxide accumulation. This may arise from the persistent action either of the anesthetic agent itself, with depression of the medullary respiratory center, or of the muscle relaxant drugs, with interference with the ability of the respiratory muscles to contract. In either case, pulmonary ventilation is diminished. Some degree of this abnormality occurs with every general anesthetic, and, when it is not marked, can readily be managed with the use of oxygen. (Oxygen should be administered by nasal catheter or mask; tents are notoriously inefficient.) While the oxygen de-

ficit may thus be corrected, the interference with carbon dioxide elimination is not, and when pulmonary ventilation is markedly insufficient, intermittent positive pressure breathing may be necessary. When the offending agent is curare or some related drug (Flaxedil, Metubine, Mecostrin,) the drug Tensilon may be used, which will counteract the effects of these drugs very effectively. It will not counteract the effect of Syncurine, or of succinylcholine. Efforts to counteract the effects of general anesthetic agents by the various stimulant drugs that have been put forward for this use are usually met with failure. One has more success if he directs his efforts toward maintaining near normal respiratory exchange and allowing the anesthetic to wear off as it will.

*Falls in Arterial Blood Pressure*

Falls in arterial blood pressure postoperatively most commonly are due to one of two causes. The first is inadequate circulating blood volume. The obvious corrective measure is blood transfusion. Pressor drugs and infusions of dextrose solutions may be used to maintain a safe level of pressure until blood can be administered. It is well to remember that the anesthetic state robs the individual of some of his vascular compensatory mechanisms, and he is thereby less well able to tolerate blood loss. The other common cause of postoperative falls in pressure is the failure to maintain an adequate pulmonary ventilation during the course of surgery. The fall here may be rapid and profound, but can usually be managed adequately with infusions of 5 per cent glucose solution and use of the Trendelenberg position. This type of hypotension is most likely to follow an anesthetic using cyclopropane, and has therefore been termed "cyclopropane shock."

*Postoperative Recovery Rooms*

The use of postoperative recovery rooms is becoming increasingly widespread, especially in the larger hospitals. To these rooms, usually located near the operating rooms, patients are taken postoperatively to be cared for until such time as they no longer require constant nursing attention. Since here one nurse can simultaneously care for more than one patient, a saving in nursing care is effected. Furthermore, a saving in the physical equipment needed for postoperative care is made. These two advantages, which form the chief rationale for the use of a recovery room, would not be realized, however, in a smaller hospital where rarely more than one surgical procedure is performed simultaneously.

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# CORRESPONDENCE

## OLDEST STATE SOCIETY

To the Editor:

A recent issue of the *Annals of Internal Medicine* referred to the Medical Society of New Jersey as the oldest state medical society in the United States. Thinking ours was, I made inquiry and received in reply a letter from Richard I. Nevins, executive officer of the Medical Society of New Jersey. Mr. Nevins stated in part:

"I understand that your concern was generated by a statement which you read in the September issue of the *Annals of Internal Medicine* to the effect that 'The Medical Society of New Jersey is the oldest society in the Western Hemisphere.' As far as our historical research has been able to demonstrate, it is, having been founded in July of 1766. The following excerpt is taken from The Charter of 1864, by means of which The New Jersey Legislature effected the re-organization of the Society.

> "Note: The Medical Society of New Jersey was founded July 23, 1766. County societies were first chartered in 1816. In 1825 the state delegated to the Society the authority to confer the M.D. degree. The Society became an original constituent of the American Medical Association when the latter body was created in 1847. Since the Medical Society of New Jersey was older than the state government, its charter did not originally derive from the state. Accordingly, the Senate and General Assembly of the State of New Jersey enacted Chapter 157 of the Laws of 1864, chartering The Medical Society of New Jersey . . . : "

Since I stated in my article, "There were Giants in Those Days," published in the NORTH CAROLINA MEDICAL JOURNAL for September, 1952, that the North Carolina Medical Society was the oldest (organized in 1799), I think it important that this error be corrected.

FREDERICK R. TAYLOR, M.D.
High Point

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## PATIENT'S MEMORANDIUM OF *OPERATIVE PROCEDURE*

To the Editor:

I am enclosing a blank copy of a form I have recently started using in regard to my surgical cases. On the day of discharge I fill this out, sign it, explain its purpose to the patient, instruct him to keep it as a matter of record, and, if at any time he is readmitted to any hospital, to present it to the doctor in charge of his case.

So frequently in my few years in surgery have I encountered abdominal scars in patients (particularly in women) who had no knowledge whatsoever as to what procedure had been performed. In deciding whether to operate, particularly if the patient has an "acute abdomen," the exact knowledge of what was removed at a previous laporotomy is, to my mind, most significant. Of course there are exceptional cases (such as advanced carcinoma) in which the physician may think it wise to withhold from the patient the exact nature of the procedure.

J. H. NEESE, M.D.

Patient's Memorandum of Operative Procedure:

The following operation .....
was performed upon.....
on ..... at ..... Hospital,
..... N. C.
....., M.D.

# BULLETIN BOARD

## COMING MEETINGS

**Conference on Industrial Health**—North Carolina Memorial Hospital, Chapel Hill, March 12.

**Postgraduate Medical Course for General Practitioners** — University of North Carolina School of Medicine, Chapel Hill, April 13, 14, 15.

**Tri-State Medical Association Annual Meeting**—Charleston, South Carolina, February 22-23.

**Statewide Conference on Handicapped Children,** sponsored by the North Carolina State Board of Health and the North Carolina Department of Public Instruction in cooperation with the North Carolina Health Council—North Carolina Memorial Hospital, May 27-28.

**Fourteenth Annual Conference on Industrial Health**—Louisville, Kentucky, February 23-25.

**National Conference on Rural Health** — Dallas, Texas, March 4-6.

**Southeastern Surgical Congress** — Birmingham, Alabama, March 8-11.

**New Orleans Graduate Medical Assembly** — New Orleans, Louisiana, March 8-11.

**Southeastern Allergy Association**—Atlanta, Georgia, March 22-27.

## NEWS NOTES FROM THE UNIVERSITY OF *NORTH CAROLINA* SCHOOL OF MEDICINE

A conference on Idustrial Health will be held at North Carolina Memorial Hospital, Chapel Hill on March 12, 1954. The conference is designed primarily for physicians who are providing part-time health and medical services to industrial establishments. The conference will be sponsored by the School of Medicine of the University of North Carolina in cooperation with the Committee on Industrial Health of the North Carolina Medical Society.

**Program**

Report on Survey by the Occupational Health Committee of the North Carolina Medical Society—
Harvey L. Johnson, M.D., Chairman

Industrial Health: An Interpretation—
William P. Richardson, M.D., Professor of Preventive Medicine, and Assistant Dean for Continuation Education, U.N.C. School of Medicine

The Challenge of Industry to the Medical Profession—
W. H. Seymour, Vice President, Liberty Mutual Insurance Co. in Charge of Loss Prevention Department

Part Time Health Services in the Small Industrial Establishment—
Logan T. Robertson, M.D., Director, Occupational Health Services, Asheville, N. C.

Environmental Health Hazards in North Carolina Industries—
Emil T. Chanlett, M.S.S.E., Associate Professor of Sanitary Engineering, U.N.C. School of Public Health

Panel Discussion on Some Factors in the Prevention of Accidents and Absenteeism
Nathan A. Womack, M.D., Professor of Surgery and Chairman of the Department, U.N.C. School of Medicine
C. O. Humphries, M.D., Director, Employee Health Service, North Carolina Memorial Hospital
William L. Fleming, M.D., Professor of Preventive Medicine and Chairman of the Department, U.N.C. School of Medicine
Frank C. Winter, M.D., Professor of Ophthalmology, U.N.C. School of Medicine
George C. Ham, M.D., Professor of Psychiatry and Chairman of the Department, U.N.C. School of Medicine

Panel Discussion on Problems in Industrial Health
N. H. Collison, Vice President for Operations, Olin Industries, Inc., Pisgah Forest, N. C.
W. H. Seymour
Joe M. Bosworth, M.D., Division Medical Director, Loss Prevention Department, Liberty Mutual Insurance Co.
Emil T. Chanlett
Logan T. Robertson, M.D.
Norman Boyer, M.D., Medical Director Ecusta Paper Co., Pisgah Forest, N. C.
R. W. Bunn, M.D., Medical Director, R. J. Reynolds Tobacco Co., Winston-Salem

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The School of Medicine of the University of North Carolina announces a three-day intensive postgraduate medical course designed primarily for general practitioners to be held at Chapel Hill April 13, 14, 15. The course is similar to the one held last year and is entitled "Implications of Newer Diagnostic and Therapeutic Techniques." Physicians will again be given an opportunity to participate in the selection of specific topics for the program.

## News Notes from the Duke University School of Medicine

A new $3,386,000 seven-floor addition to Duke Hospital, providing a new out-patient clinic and more than 100 new beds, is expected to be under construction this spring, Duke University President Hollis Edens has announced.

As early as 1946 the Duke Endowment made available a sum of $1,000,000 toward the cost of a new addition. The remaining cost will be met by contributions from a number of private sources to the medical and hospital building fund.

The new wing will bring the number of beds to 668, making Duke, among private general hospitals throughout the South, second in size only to Johns Hopkins Hospital, Baltimore, Maryland. It will also improve the outpatient clinic, already termed Duke's "greatest single contribution to Southern medical care."

* * *

Duke University's fifth Medical Town Hall meeting, which was held Sunday, February 7, brought North Carolinians the latest information on "Wonder Drugs," including the sulfa drugs, Terramycin, streptomycin, and other antibiotics.

Dr. Elijah E. Menefee, chest specialist at Duke, and Dr. Samuel P. Martin, internist, were the principal speakers.

* * *

The following Duke University doctors served on the faculty of the American Academy of Orthopedic Surgeons in Chicago, January 23-28: Dr. J. E. Markee, J.B. Duke professor of anatomy; Dr. Lenox D. Baker, professor of orthopedic surgery and director of the North Carolina Cerebral Palsy Hospital; Dr. Barnes Woodhall, professor of neurosurgery and chairman of the Surgical Section of the Council of Chief Consultants to the Veterans' Administration; and Dr. Charles E. Erwin, chief surgeon at the Georgia Warm Springs Foundation and lecturer in orthopedics at Duke.

Dr. J. Leonard Goldner, assistant professor of orthopedics, delivered a paper on reconstructive surgery of the hand in cerebral palsy and spastic paralysis. He also attended the annual meeting of the American Society for Surgery of the Hand in Cleveland, January 21.

Dr. Baker attended an executive committee meeting of the American Orthopedic Association, reporting as chairman of the program committee on final arrangements for the Association's meeting in June.

* * *

Dr. Barnes Woodhall, Duke University neurosurgeon, has been elected chairman of the Surgical Section of the Council of Chief Consultants to the Veteran's Administration.

The Council, made up of some 30 top medical and surgical specialists from throughout the nation, advises the Chief Medical Director on professional relations, policies, procedures, standards, and programs in the various specialties.

* * *

Dr. Ladd W. Hamrick, Jr., fellow in medicine at Duke, described to the Southern Section of the American Federation for Clinical Research, meeting in New Orleans last month, a sure and simple procedure for inserting a catheter (a long thin plastic tube) into the main artery carrying blood to the brain for purposes of studying metabolism of the brain.

Many techniques have been devised for studies of the brain, but the Duke technique is one of the simplest methods not involving surgery. Doctors can be certain of the position of the catheter by injecting a weak solution of floricin and checking its course under an ultra-violet light.

## North Carolina State Board of Health

Recently, the National Foundation for Infantile Paralysis annouced the development of a promising vaccine for the prevention of paralysis from poliomyelitis. This vaccine has proved effective in the prevention of the disease in animals which have been given the vaccine and are later infected with the three known strains of poliomyelitis virus.

With the hope that the new vaccine will be equally effective in the prevention of paralysis from poliomyelitis in humans, the Foundation is now sponsoring a poliomyelitis vaccination field trial in which it is proposed to vaccinate from one-half million to one million children in selected age groups during 1954. The vaccine will be given to children residing in selected counties in which the incidence of poliomyelitis has been higher during the past five years than the average for the state as a whole.

There has never been greater professional or public interest shown in a medical research project than is now sweeping the country in connection with this proposed poliomyelitis vaccine field trial. The State Board of Health shares this interest but wishes to emphasize to the people of North Carolina that the administration of this newly developed and as yet unproved vaccine is in reality just what is claimed for it by the scientist who developed the vaccine and the Foundation that is sponsoring it —It is a *field trial* to determine its effectiveness, and there is, as yet, no absolute assurance that the poliomyelitis vaccine will fulfill the hopes of those who are sponsoring it.

The scientist who has developed the vaccine, Dr. Jonas Salk, has himself stated about the vaccine which is now under study: "We do not want to allow any distortion of the fact that we are still actively in the stage of clinical investigation; and that this work must be continued, but it must be continued gradually and cautiously."

On the basis that this vaccine is still unproved as to its effectiveness but with the assurance that, through tests already carried out in both animals and humans, it is both safe for widespread administration to children and promising as to its effectiveness in the prevention of paralysis from poliomyelitis, the State Board of Health has submitted the proposal to use the vaccine in North Carolina for the consideration of local health authorities and local medical societies in several counties of this state. Counties will be approved by the Foundation for the use of this vaccine on the following general criteria: (1) Individual counties or adiacent counties included in district health units having a population of 50,000 or more; (2) A poliomyelitis case rate for all age groups which has been above the five-year average for the state as a whole; (3) An average case rate in the 5-year to 9-year age group which has been above the five-year average for the state as a whole; (4) Counties maintaining health facilities (personnel) adequate to administer the vaccine successfully to the selected age groups according to the recommended schedule.

Each batch of vaccine used will be previously tested for safety by Dr. Jonas Salk who developed the vaccine, by the manufacturer of the vaccine, and by the Laboratory of Biologic Control of the National Institutes of Health, U. S. Public Health Service, Bethesda, Maryland. It will be released for use in North Carolina only in those counties in which its use is endorsed by both the local health authorities and by the local medical society, and with the assurance that its administration will be with the participation of local physicians.

It is the fear of paralytic effects from poliomyelitis that makes the disease such a dreaded one, yet

even in severe epidemics the disease may cripple no more than one child in many hundreds of the child population under ten years of age. This very small portion of children who under ordinary circumstances are stricken by poliomyelitis means that the new vaccine must be given to many thousands of children, or perhaps to several million, and over a period of several years, before the effectiveness of the vaccine can be accurately determined.

So long as the vaccine does no harm, and the State Board of Health has that assurance from its sponsors, and in that it may prove to be the long sought poliomyelitis preventive, it is endorsed by the State Board of Health for use in selected areas of this state.

## North Carolina Medical Care Commission

The Medical Care Commission received an allotment of $300,000 from the 1953 Legislature for continuing and expanding its student loan program with a view to providing doctors, dentists, pharmacists, and nurses pledged to serve at least four years in rural communities of the state following the completion of their training.

Although after the funds became available July 1, 1953, only a few weeks remained before the opening of the fall term of the professional schools, the Commission has approved loans to 28 students, 14 of whom are studying medicine, 9 dentistry, 4 pharmacy, and 1 nursing. All of these students are pledged, upon the completion of their authorized training, each to serve at least four years in a rural community of North Carolina, defined by law as a town, village, or rural area of 2,500 or less. Of the $300,000 appropriated by the 1953 Legislature, $105,900 will be required as loans to carry 28 students until they are graduated by professional schools.

Fifty thousand dollars was provided by the 1945 Legislature to the Commission for use as student loans, limited at first to students of medicine. Later the program was broadened to include students of dentistry, pharmacy, and nursing. Nineteen students were aided with this loan fund. All of these students have graduated from professional schools. Some are now practicing in rural areas of North Carolina, others were called for military duty, and a few are still engaged in completing internships in hospitals. Those now engaged in rural practice are repaying their indebtedness at the rate of 2 per cent monthly.

The Medical Care Commission also received from the 1953 Legislature an allocation of $100,000 for use as loans to students of medicine and nursing who will agree, when the authorized training is completed, to accept employment with state-owned psychiatric hospitals. A student can liquidate a year's loan with interest in this program with a year's service in a state hospital. In addition, he will receive the compensation paid by the hospital for professional services.

Four medical students have received loans under this program for training psychiatric personnel, three of whom are now in the second year of medicine and one in the third year of medicine. An encumbrance of $13,200 will be required to carry these students to graduation. There is evidence that the availability of the loans is becoming known more widely, that interest in the loan program is increasing, and that the remainder of the loan funds available may be encumbered during the second year of the Legislative biennium, which will end June 30, 1955.

## William H. Osborn Foundation

A revolving fund to aid in the rehabilitation of deserving alcoholics throughout the Southeast was announced recently by Mrs. W. H. Osborn, president of The Keeley Institute, Greensboro, and contributor to the fund.

It is to be known as the William H. Osborn Foundation and is established in honor of the late Colonel W. H. Osborn, North Carolina industrialist and philanthropist. Mrs. Osborn succeeded Colonel Osborn as president of The Keeley Institute.

The William H. Osborn Foundation is being established "in memory of Colonel Osborn as a loan fund without interest to help alcoholics of low income arrange for hospitalization and treatment under conditions set forth by the trustees," Mrs. Osborn pointed out. It will be available to alcoholics in the Southeast who show a sincere desire to be treated for the disease and upon proof of financial need. All applicants will be screened by the board of trustees after recommendation by some responsible person. Funds will be used in hospitalization and medical treatment for the alcoholic and neuropsychiatric evaluation when advisable. Additional funds are available for research in the field of alcoholism.

Mrs. Osborn added that the work of the foundation will be carried on with the help of those helped. "We believe that those who have been rehabilitated through the foundation's assistance will return to work and repay the loan."

"In other words this will provide a revolving fund to provide necessary treatment and medical care of the disease of alcoholism which otherwise would not be available."

## Public Relations Conference

The Seventh Annual Public Relations Conference of the Medical Society of North Carolina was held Friday, February 12, at the Sir Walter Hotel in Raleigh.

Speakers at this year's conference included Mr. Steven M. Spencer, of Philadelphia, Association Editor of *The Saturday Evening Post;* Mr. William L. McGrath of Cincinnati; President of the Williamson Heater Company and Employer Delegate to the International Labor Organization Conference in Geneva, Switzerland; and Mr. Morris McGough, of Asheville, Executive Vice-President of the Asheville Agricultural Development Council.

## Forsyth County Medical Society

The monthly meeting of the Forsyth County Medical Society was held in Winston-Salem on January 12. Mr. Horace Cotton, executive director of Mastron, Inc., of Durham spoke on "The Business of Practicing Medicine."

## Edgecombe-Nash Medical Society

The Edgecombe-Nash Medical Society met in Rocky Mount on January 13. Dr. R. M. Whitley, newly elected president, presided. Dr. Lewis Thorp, in charge of the scientific program, presented as guest speaker Dr. David Jones of the Department of Neurology, North Carolina Memorial Hospital, Chapel Hill.

## News Notes

Dr. Orin R. Yost, formerly of Edgewood Sanitarium, Orangeburg, South Carolina, has announced the opening of his offices at 211 John Anderson Highway, Ormand Beach, Florida, for the practice of psychiatry.

## Borden Salutes Medical Profession in North Carolina Cities

The infant formula product manufacturer and the medical profession are both highly conscious of the importance of public relations at all operating levels. Latest evidence of this is the series of test advertisements appearing in the *North Carolina Medical Journal* in which The Borden Company's Prescription Products Division salutes the medical profession in selected North Carolina cities. General response to these ads in this journal, one of four state journals selected for the test, has prompted the Company to extend the campaign.

Through this medium, Borden's hails the newborn babies of these selected cities and the physicians, hospitals and pharmacies which bring them the high standards of American medicine. This Borden division, which produces and ethically promotes infant formula products, features Bremil, Mull-Soy and Dryco in the city salute ads.

Institutional in character, the advertising copy points up the community aspect of the national organization. The Borden name has a 100-year history in the field of infant feeding, since it was in 1853 that the Company's founder, Gail Borden, originated preserved milk to provide safe nutrition for babies.

With the current February issue of the *Journal*, the five North Carolina cities featured to date include Greensboro, Winston-Salem. Asheville, Raleigh, and Charlotte. Durham will be saluted in the next issue of the *Journal*.

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## Southeastern Allergy Association

Speakers at the Southeastern Allergy Association meeting to be held at the Hotel Dinkler Plaza in Atlanta, March 25-27, will include Dr. Homer Prince, president of the American College of Allergists; Dr. John Shelton, president of the American Academy of Allergy; Dr. Ethan Allen Brown, editor of the *Annals of Allergy*, Dr. Oscar Swinford, past president of the American Academy of Allergy, and Dr. A. S. Richardson, associate director of the Chemical Division, Proctor & Gamble.

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## News Notes from the American Medical Association

### Medical Education Problems to Be Topic of Conference

The problem of postgraduate medical education needs, and how these best can be met by medical schools, was considered at the fiftieth annual Congress on Medical Education and Licensure in the Palmer House, February 7-9.

The meeting was sponsored by the American Medical Association's Council on Medical Education and Hospitals, with the cooperation of the Federation of State Medical Advisory Boards of the United States and the Advisory Board for Medical Specialties.

Dr. Edward J. McCormick, Toledo, president of the American Medical Association, who was one of the principal speakers, stressed the importance in undergraduate medical education of instruction in fundamental professional ethics, public relations and medical practice.

This being the golden anniversary of the formation of the Council on Medical Education and Hospitals, Dr. Herman G. Weiskotten, Skaneateles, chairman of the council, highlighted the contributions of the American Medical Association to the training of doctors.

Dr. Louis H. Bauer, New York, president of the American Medical Education Foundation, discussed the drive for financial contributions by physicians to aid medical schools.

With military needs for medical personnel a problem which may arise unexpectedly, Dr. Frank B. Berry, Washington, assistant secretary of defense (health and medical), was asked to express the views of military authorities on how these requirements best can be met.

Frank G. Dickinson, Ph.D., Chicago, director of the A.M.A.'s Bureau of Medical Economic Research, reported on physician distribution, as disclosed by a survey undertaken by the bureau. Aura E. Severinghaus, Ph.D., New York, associate dean of the Columbia University College of Physicians and Surgeons, presented the highlights of a survey on preprofessional education.

The program presented by the Advisory Board for Medical Specialties considered the potentialities of postgraduate medical training in hospitals not affiliated with medical schools. The current trends in licensure and examination procedures also was discussed.

The Federation of State Medical Boards considered the effect of medical licensure on medical education, and the relationship between hospital internship and licensure.

* * *

### Regional Meeting on Veterans Care

More regional conferences on veterans medical care will be held during 1954 under the sponsorship of the A.M.A.'s Council on Medical Service through its Committee on Federal Medical Services. These meetings have a fourfold purpose: (1) Develop a working liaison with state society committees concerned with veterans' problems; (2) Acquaint an increasing number of physicians with A.M.A. policy and the facts regarding veterans care; (3) Learn the local situation regarding this policy in various states, and (4) Discuss ways of carrying out the instructions of the House of Delegates which adopted a firm stand on veterans medical care at its meeting last June.

* * *

### Radio and TV Plans Announced

America's physicians will be "on the airways" more than ever during the new year as the A.M.A.'s Bureau of Health Education announces plans for new radio and television programs. In response to the trend of listening audiences toward local radio shows, emphasis will be placed on locally originated programs both in radio and television.

Present television plans call for a 30-minute film relating to some aspect of medical care to be produced jointly by the Bureau and the Department of Public Relations. This film probably will be available about the time of A.M.A.'s June meeting. In addition, several new sequences will be developed in the "What To Do" series—the five-minute television films which star popular woman's commentator Nancy Craig explaining safe procedures to follow in home emergencies.

Inaugurating a new service for state and county medical societies, the Bureau also is planning the preparation of "script-clip packages" for television. These packets will contain outline scripts which can be narrated by local doctors while film clips illustrating the topic are shown on the television screen.

Regarding radio plans, the Bureau will concentrate on new electrical transcription during 1954. These will be released approximately at the end of April, June, and October. The first will be devoted to science and superstition, and other topics will be announced later.

* * *

### A.M.E.F. Contributions Exceed One Million Dollars

Contributions to the American Medical Education Foundation during the first 11½ months of 1953 totalled $1,047,000. The present total exceeds donations received during the entire year of 1952 by $141,000. More than 24,500 physicians contributed $847,361 directly to 70 of the nation's 79 approved medical schools.

Pans for the 1954 campaign were discussed at the third annual meeting of AMEF state chairmen January 24 in Chicago.

* * *

### A.M.A. Studies Physician Attitudes on Insurance

While there is no doubt that most physicians favor the many forms of voluntary health insurance now in existence over any compulsory tax system, no attempt has been made to analyze attitudes of physicians regarding certain aspects of the voluntary type of protection. The A.M.A.'s Council on Medical Service—through its Committee on Prepayment Medical and Hospital Service—currently is sponsoring a survey of these underlying doctor attitudes.

Since voluntary insurance programs are insuring an increasing number of persons each year, the attitudes of physicians—as they are the ones who render professional treatment to policyholders — are important factors to consider in the future plans of insurance programs.

Among other things, the A.M.A. survey is designed to bring to light certain physician attitudes regarding service benefits, the extent to which the principle of co-insurance should apply, the adequacy of benefits (fee schedules), the extent to which insurance may influence the cost of health care, and so forth.

Although the Council on Medical Service is sponsoring this study, the questionnaire itself was compiled after consultations with the Bureau of Medical Economic Research, representatives from Blue Shield and other organizations.

* * *

### A.M.A. Exhibit in Nation's Capital

By special invitation of the museum, the American Medical Association will display its exhibit, "The Organs of the Human Body," at the Smithsonian Institution in Washington, D. C., during 1954. After this year, this exhibit will be available for showings in other museums throughout the country.

A new exhibit—"The Physician's Responsibility in Highway Accidents"—calls the doctor's attention to the fact that he should warn patients about the dangers of driving while under the influence of sedatives, antihistamines, or anticonvulsive drugs. For professional showings only, this exhibit may be booked through the A.M.A.'s Bureau of Exhibits.

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## Travel Plan to A. M. A. California Meeting

It may be of interest to JOURNAL readers that the Moyers Travel Bureau, 34-38 Peachtree Street, N. W., Atlanta, Georgia, is offering a plan of travel entitled "Southern AMA Special" in connection with the meeting of the American Medical Association in San Francisco, June 21-25, 1954. Briefly, the "Southern AMA Special" includes an 8,000 mile all expense tour of America's scenic circle; 20 days of travel, pleasure and achievement. All places within the reach of the average person by special arrangements explained in the special folder which the Moyers Travel Bureau has prepared. If interested, the reader may refer to advertisements scheduled for February and March in the NORTH CAROLINA MEDICAL JOURNAL, and reservations may be arranged by writing to the Moyers Travelers Bureau.

## The Month in Washington

Although the budget, defense, and farm policy are monopolizing Washington headlines, Congress is paying more than casual attention to the health and social security fields. In these, as in other legislative areas, it has for its guidance a specific program, laid down by President Eisenhower in his various messages during the first few weeks of the session.

Before Congress settled down to its task, the President met with a group of American Medical Association leaders, who discussed with him the Association's position on several important pieces of legislation. Present at the White House meeting, in addition to Mr. Eisenhower and Sherman Adams, Assistant to the President, were A.M.A. President Edward J. McCormick, Trustees' Chairman Dwight H. Murray, President-Elect Walter B. Martin, and Washington Office Director Frank E. Wilson.

Congress got into the health and welfare field with no waste of time. Within five days after Congress reconvened the House Interstate and Foreign Commerce Committee, under the chairmanship of Rep. Charles Wolverton (R., N.J), began an exhaustive series of hearings on voluntary health insurance, further evidence that the Administration is determined to get some action in this direction.

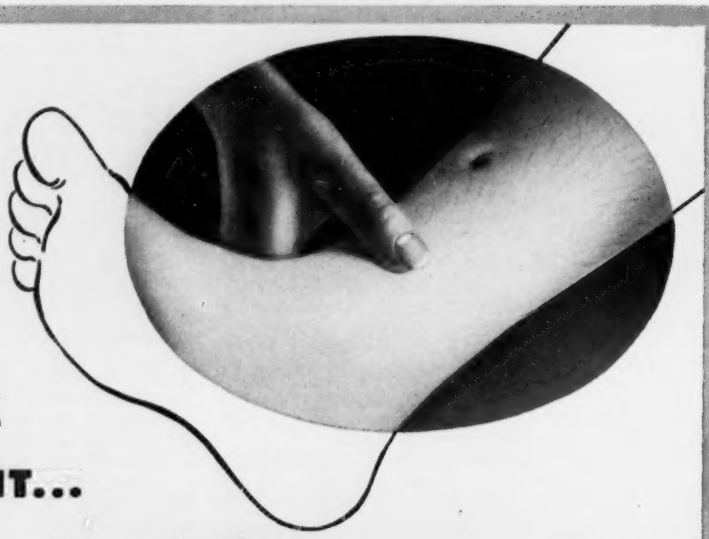
Basically the Wolverton idea is a Federal Deposit Insurance Corporation for voluntary health insurance. In about the same way the Federal Deposit Insurance Corporation insures bank deposits up to a certain limit, the Wolverton program would insure (or re-insure) various types of hospital, surgical, and medical insurance programs.

Another piece of legislation, receiving favorable attention, also would help families with their medical expenses—a proposed liberalization of income tax deductions allowed for medical expenses. Under present law, only that part of medical expense exceeding 5 per cent of taxable income may be deducted. The pending legislation would drop this to probably 3 per cent, and raise or eliminate the maximum limit. In past years scores of bills pointed in this direction have been introduced. If this is incorporated in the general tax overhaul legislation, it is believed to have a good chance of enactment.

At this writing it is too early for any good indication as to whether physicians will be brought under social security. However, a substantial number of the members of the House Ways and Means Committee, which must pass on this legislation, are known to feel that compulsion should not be used on groups that do not want Old Age and Survivors Insurance.

From all indications available during the first few weeks of Congress, a showdown fight may be unavoidable on medical care for military dependents. Defense Department, with support from the President, wants dependent care extended and made uniform among the three services, with military physicians carrying as much of the responsibility as they can. Under the Defense Department plan, dependents who could not be taken care of at military installations would be allowed to obtain their care from private sources, with the government paying almost all of the cost.

The American Medical Association agrees with the Defense Department that all dependents should receive medical benefits as nearly uniform as possible. However, A.M.A. contends that wherever possible dependents should use private physicans and private hospitals, and that the military personnel and facilities should be employed only where civilian facilities are inadequate.



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WINTHROP

1. Abramson, Julius, Bresnick, Elliott, and Sapienza, P. L.: New England Jour. Med., 243:44, July 13, 1950.

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## American Society of Plastic and Reconstructive Surgery

The Foundation of the American Society of Plastic and Reconstructive Surgery announces the regulations of the fifth annual scholarship contest:

1. The contest in Junior Classification is restricted to residents in training and to plastic surgeons who have been in practice no longer than five years.

2. Two main prizes are offered, each consisting of a three-month plastic surgery scholarship with full maintenance in a number of selected leading services, in the United States and abroad.

3. The subject matter of the essay must be the result of some original research (either clinical or experimental) in the field of plastic and reconstructive surgery. Thesis should be of about 5,000 words, and written in English.

4. Work previously published wholly or in part is not acceptable.

5. Expenses of travel between the services will be allotted.

6. A silver plaque or a certificate of honorable mention is also offered for a winning essay in Senior Classification to contestants active in practice of plastic and reconstructive surgery for more than five years.

7. Manuscripts will not be accepted by the Award Committee after July 1, 1954.

8. The winning essays will be presented in person at a formal program of the Foundation of the American Society of Plastic and Reconstructive Surgery to be held in the fall of 1954.

For further information, write to the Award Committee, c/o Jacques W. Maliniac, M.D., Chairman, 30 Central Park South, New York, New York.

## National Society for Crippled Children and Adults

A record expansion of direct services, with the opening of more new facilities for crippled children in 1953 than ever before in its history, has been reported by the National Society for Crippled Children and Adults.

Lawrence J. Linck, executive director of the Easter Seal Society, made this anouncement as the Society's 1953 annual report, "Out of the Dark!" was distributed this week.

In the report, which marks the Society's 32nd year of service to the nation's crippled, Mr. Linck said that "numerous facilities and services are being opened and expanded to meet the needs of a growing number of crippled children and adults. The enthusiastic support given to the hnudreds of Easter Seal services is the best indication that the American public has chosen a mature viewpoint toward the problem of the crippled."

* * *

The first authoritative manual of information on the nation's rehabilitation centers has been published by the National Society for Crippled Children and Adults, the Easter Seal Society, Lawrence J. Linck, executive director, announced.

"Rehabilitation Centers in the United States," one of the most useful recent publications in the field of service for the crippled, grew out of the First National Conference on Rehabilitation Centers jointly sponsored by the National Society and the Office of Vocational Rehabilitation of the U. S. Department of Health, Education, and Welfare.

The volume contains descriptions and statistics on every phase of rehabilitation procedure. It is available at $1.50 per copy from the headquarters of the National Society, 11 South La Salle St., Chicago 3, Illinois.

## American Hearing Society

Competition for the Kenfield Memorial Scholarship, awarded anually by the American Hearing Society to a prospective teacher of lipreading, will open March 1. Application blanks may be obtained by writing to the society's national headquarters, 817-14th St., N.W., Washington 5, D. C.

Deadline for returning completed applications is May 1. They are to be mailed to Mrs. Eleanor C. Ronnei, care of the New York League for the Hard of Hearing, 480 Lexington Ave., New York 17, New York. Mrs. Ronnei is chairman of the American Hearing Society's Teachers Committee. The winner will be anounced during National Hearing Week, May 2-8.

## Symposium on Chest Disease

The third anual Symposium on Tuberculosis and Other Chronic Pulmonary Diseases for General Practitioners will be held in Saranac Lake, New York from July 12 through 16, 1954. It is approved by the American Academy of General Practice for 26 hours of formal credit for its members.

The symposium is sponsored by the American Trudeau Society, the Saranac Lake Medical Society and the Adirondack Counties Chapter of the New York State Academy of General Practice. The registration fee is $40 for A.A.G.P. members and $50 for non-members.

Complete information concerning this program can be obtained by writing: Richard P. Bellaire, M.D., Chest Disease Symposium, P. O. Box 2, Saranac Lake, New York.

## National Gastroenterological Association

The National Gastroenterological Association announces that the name of its official publication, established in 1934, has been changed from *The Review of Gastroenterology* to *The American Journal of Gastroenterology* effective with the January, 1954 issue. The publication will continue to be edited by Dr. Samuel Weiss, editor-in-chief, and an editorial board consisting of Drs. Milton J. Matzner, James T. Nix, and Michael W. Shutkin.

The current issue of *The American Journal of Gastroenterology* will be volume 21, no. 2, continuing in series with the last issue of the *Review of Gastroenterology* published December, 1953.

## National Foundation for Infantile Paralysis

The National Foundation for Infantile Paralysis announces the availability of a limited number of postdoctoral clinical fellowships in physical medicine and rehabilitation to candidates who wish to become eligible for certification in that field. Fellowships will cover a period of one to three years at training centers which have been approved for residences in physical medicine and rehabilitation. Stipends to Fellows are based on the individual need of each applicant.

In addition to these full-term fellowships, the National Foundation is making available a limited number of short-term fellowships to physicians who wish to become better acquainted with physical medicine and rehabilitation as it relates to their particular specialties. Such training is being offered to physicians who, in addition to meeting the other requirements, have completed a minimum of one-year residency in orthopedics, pediatrics, neurology, or internal medicine.

The Foundation also announces the availability of

a limited number of postdoctoral fellowships in the field of public health and preventive medicine.

The fellowships are for one or more years at an approved school of public health, with a period of field experience when arranged by the school. Stipends to Fellows are based on the individual need of each applicant.

Complete information concerning qualifications and applications for all fellowships may be obtained from the Division of Professional Education, National Foundation for Infantile Paralysis, 120 Broadway, New York 5, New York.

(BULLETIN BOARD CONTINUED ON PAGE 104)

# BOOK REVIEWS

**School Health Services:** A Report of the Joint Committee on Health Problems in Education of the National Education Association and the American Medical Association with the cooperation of contributors and consultants. Price, $5.00.

At the suggestion of the American Medical Association, corresponding committees of the National Education Association and American Medical Association were approved in 1911 as an official joint committee. Co-workers, recognizing school health needs, believed that a joint committee could utilize the resources of education and medicine through their professional organizations further to aid and expand school health education programs. The Joint Committee, presently composed of 10 members, five representing the N.E.A. and five the A.M.A., meets annually to plan projects and review subcommittee work. It has published numerous reports, the first major one being "Health Education" in 1924, with revised additions appearing in 1930, 1941, and 1948.

"School Health Services" is the second major report of the 10-member Joint Committee. The basic material was prepared by contributors from various parts of the country and completed by an editorial committee under the direction of Dr. Charles C. Wilson, professor of education and public health at Yale University. It is a "modern comprehensive guide for health procedures in small or large school systems," and describes the health responsibilities of schools, stresses the need for coordination of school efforts with community agencies, parents, and private practitioners, gives special consideration to the role of the teacher, and good attention to utilizing health services to educational advantages.

This book is a good reference source for physicians concerned with school health activities, and should be of special interest to the family doctor, health officer, pediatrician, ophthalmologist, oculist, otolaryngologist, and physician members of school committees and Parent-Teacher Associations. School health terminology is defined and in some instances revised (for example, "health appraisals" is substituted for "health examinations"). The book contains good examples of cumulative health records, communicable disease charts, Neilson artificial respiration method, emergency care procedures ("calling the doctor"), physical variations for teacher observation, growth records, school health suites, basic first aid supplies, building self-inspection blanks, teacher examination cards, school health council organization charts, and so forth, appraising visual status and testing auditory acuity.

Physicians as well as educators will be pleased to note the constant interpretation of school health services as realistic educational experiences for the child as, "The trend toward having children obtain periodic examinations from their own physicians and dentists accentuates the need for procedures that help them and school personnel in understanding their respective fields of activity and the relationships that exist."

Cautionary notes are sounded throughout the report. For example: (1) "In health counseling, printed notices are cold, formal, and impersonal. A face-to-face conference between parent, physician, nurse or teacher is more effective in securing needed action"; "Too many cooks spoil the broth"; "The number of defects found and corrected are often reported, and cited as proving the value of school health services. Too often, the data neither weigh the seriousness of the defects specified nor indicate the nature and extent of follow-up"; "Health in the optimal sense is not at present measurable; at least not without undertaking special and extensive study"; "Legal enforcement is necessary only in cases where cooperation and leadership have failed." Workers are urged to consider local problems. (Take hookworm, for example. How many symptomatic cases of hookworm disease unknown to the school are coming to the attention of local physicians?) In the way of cooperation and coordination of community agencies and assumption of responsibility for school health programs, "no single pattern can be set."

Regarding the cooperation of physicians in school health programs, the report states: "In instances where there has been no provision for cooperation between the school and private practitioners, school officials have sometimes felt that these persons were not interested in school health problems, and conversely, practicing physicians and dentists have inclined to the opinion that school officials were attempting to dictate the manner in which they should practice medicine and dentistry. Discussion of these differences virtually always reveals that both groups have been incorrect in their assumptions and that all are working toward similar goals." "The duties of the physician should be defined so that he knows exactly what is expected of him. . ." "Cooperation of physicians is usually improved if they have a part in formulating policies of a school health program and are kept informed. . ." "Participation of practicing physicians in evaluation of school health services is bound to increase the effectiveness of the program. . ."

The book is chock-full of references for further reading, glimpses into reports of the A.M.A., Academy of Pediatrics studies, consultants in school health and related fields throughout the country, major organization and agency activities directly related to school programs, history of school health developments and specific organizational leadership in same. It also contains excellent chapters on "courageous" administrative aspects and evaluation, school health services, in addition to special chapters on legislation, special problems such as heart diseases, school sanitation, adjusting programs to individual needs, and a list of publications of the joint committee.

It makes reference to the biennial conferences on "Physicians and Schools" sponsored by the A.M.A. Bureau of Health Education, and reports that the A.M.A. nationwide survey to determine the extent of physician participation in school health services suggests that medical societies appoint a school health committee to acquaint physicians with school health problems and to provide a simple, orderly way of coordinating the efforts of those concerned with the health of school age children.

**Music Therapy.** Edited by Edward Podolsky, M.D., Department of Psychiatry, Kings County Hospital, Brooklyn, New York. 335 pages. Price, $6.00. New York: Philosophical Library, 1954.

Since ancient times men have recognized the power of music over the mind and the emotions. Music has been used to soothe, to stimulate, to relax, to alleviate grief, fear and anxiety, to divert, to release tensions, to change one mood for another, and to modify or intensify existing moods. David's ability to dispel Saul's depression with his harp is only one of many examples of the use of music to alleviate the symptoms of physical and mental illness.

More recently psychiatrists, psychologists, and music therapists have sought to evaluate the physiologic as well as the emotional effects of music and to investigate the practical application of music therapy in a variety of mental, emotional, and physical states. In the present volume the editor has compiled thirty-two papers by various authors dealing with different aspects of the problem. How music is being used for therapeutic purposes in hospitals throughout the United States is indicated by such titles as: The Relation of Music to Disease of the Brain, The Recognition and Acceptance of Mood in Music by Psychotic Patients, The Organization of a Music Program as a Rehabilitation Measure for the Mentally Ill, Music as an Adjunct to Electroshock Therapy, Moderating Anger with Music, Music Therapy in Depression, Music Therapy and the Tension Headache, Music in Psychosomatic Gastric Disorders, The Therapeutic Value of Music in the Hospital and Operating Room, Music and the General Activity of Apathetic Schizophrenics, Effects of Music in the Heart, and Music in Military Medicine. A number of the articles include lists of selections which have proved useful in different physical and emotional states.

This book should be of practical value to the music therapist or recreational director charged with designing a program of activities for a general or psychiatric hospital. It should also serve to stimulate further investigation in a field which, despite recent accomplishments, is still largely unexplored.

## Classified Advertisements

**An opening in city of twenty-five to thirty thousand population for young eye, ear, nose and throat physician. Reply to 79-HCW, P. O. Box 790, Raleigh, North Carolina.**

SPECIAL PHYSICIAN and FAMILY TOUR of Canadian Rockies, California, and Mexico in connection with A.M.A. San Francisco meeting in June. Twenty-Day SOUTHERN A.M.A. SPECIAL, 8,000 mile all expense tour. June 13 to July 2, 1954. HOTELS, BOATS, TRAINS, MOTOR TRIPS, Etc., all reserved before you start — $445. MOYERS TRAVEL BUREAU, 34-38 Peachtree Street, N. W., Atlanta, Ga. PLAN NOW — A REAL VACATION OPPORTUNITY.

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# BULLETIN BOARD

(CONTINUED FROM PAGE 102)

## HARVARD SCHOOL OF PUBLIC HEALTH

Two Harvard School of Public Health scientists left January 15 on a series of air hops that will take them more than 25,000 miles around the world. Primary purpose of the two-and one-half month journey is to explore with health leaders in several Far Eastern nations the possibility of the Harvard School of Public Health establishing a long-term, two-way "bridge of health" with a health institution in Asia.

Brigadier General James S. Simmons, USA (Ret.), dean of the Harvard School of Public Health, and Dr. Hugh R. Leavell, professor and head of the School's Department of Public Health Practice, will touch down in at least 17 countries and territories during their globe-circling flight.

## PAN-PACIFIC SURGICAL ASSOCIATION

Doctors are cordially invited to attend the Sixth Congress of the Pan-Pacific Surgical Association to be held in Honolulu, October 7-8, 1954, and are urged to make arrangements as soon as possible if they wish to be assured of adequate facilities.

For further information, please write to F. J. Pinkerton, M.D., Director General, PAN-PACIFIC SURGICAL ASSOCIATION, Suite Seven, Young Building, Honolulu, Hawaii.

## U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

The sixth annual symposium on Recent Advances in the Study of Venereal Diseases will be held in the auditorium of the Department of Health, Education, and Welfare, Washington, D. C., on April 29 and 30, 1954, Dr. James K. Shafer, chief of the Public Health Service's Division of Venereal Disease, has announced.

The sessions are open to all physicians and workers in allied profession: who are interested in participating. These symposiums usually draw hundreds from all parts of the country, and are the occasion for exchange of the latest available information by some of the outstanding authorities in the field of venereal disease.

The topics that will be discussed at this symposium will cover many aspects of venereal disease control including basic and clinical research, serology, epidemiology, treatment, program operation, and professional education.

* * *

A report on current practices in the reporting of occupational diseases and in the collection of incidence statistics has just been released by the U. S. Public Health Service.

Much is known about the causes, prevention, and control of job-related illnesses. Information on the incidence and severity of specific occupational diseases, however, is generally lacking. This report seeks to determine the responsible factors with a view to facilitating the improvement of occupational disease reporting practices.

Also just off the press is a popularly-written pamphlet on the causes and prevention of occupational skin diseases. This problem has special significance in that dermatitis is the most common occupational disease that attacks the working man.

While the limited supply lasts, sample copies can be made available from this Division upon request to persons and organizations concerned with health problems in industry. Copies may also be procured from the Superintendent of Documents, Government Printing Office, Washington 25, D. C. Public Health Service Publication No. 288, "Occupational Disease Reporting," and Public Health Service Publication No. 306, "Occupational Skin Diseases," are priced at 40 cents and 10 cents, respectively.

* * *

Despite a relatively severe influenza outbreak in January and February, the United States death rate for 1953 remained at the low level of 9.6 per thousand population, according to a preliminary estimate released today by the Public Health Service of the U. S. Department of Health, Education, and Welfare. This low rate has been achieved in only two previous years, 1950 and 1952, though the rate has been less than 10 deaths per thousand population since 1948.

## VETERANS ADMINISTRATION

For the past four years, Veterans Administration has conducted the most extensive war on tuberculosis among veterans ever known in the history of the country.

In the four year period that the program has been under way on a fully implemented basis, VA has screened 3,217,000 persons for tuberculosis. These include 2,513,000 patients and 704,000 employees. Among these two big groups, VA discovered 12,740 cases of active pulmonary tuberculosis and 34,470 cases of inactive pulmonary tuberculosis.

Among the 704,000 VA employees screened, approximately 85 per cent of the active cases discovered were in the early or minimal, stages. Nearly 91,000 such conditions were discovered during the last year of the survey. A minority of these were serious cases requiring immediate care. Most of them were cases which did not require immediate attention, but their early discovery permitted the persons to become aware of the conditions and thus enabled them to take proper precautionary measures.

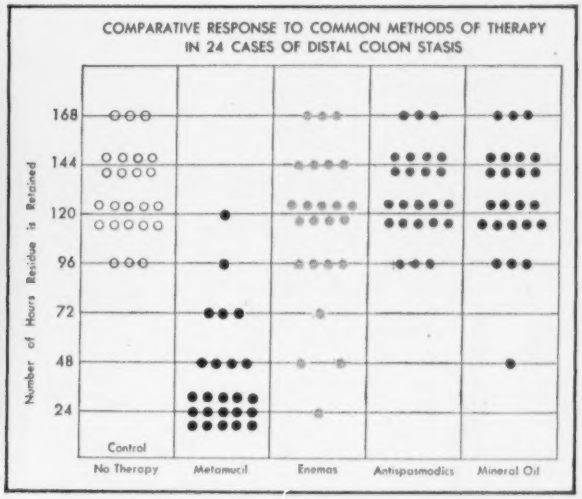
## DEPARTMENT OF THE ARMY

More than 50 medical colleges and large civilian hospitals throughout the United States have entered into an informal agreement with Major General George E. Armstrong, Army Surgeon General, whereby each will furnish a limited number of highly qualified doctors and dentists for key specialist assignments in a 1,000-bed general hospital for employment only in time of a major national emergency, the Department of the Army made known recently.

This agreement is a modification of the Reserve Hospital plan used in World Wars I and II under which a formally organized group was required to conduct military training, and secure a full complement of commissioned officers. The modified arrangement permits the hospital or medical school to retain these key professional staff members, selected for the unit for several months following the initial impact of the Emergency. These personnel would not be required until after the Reserve hospital units had been called to active duty and the administrative and housekeeping personnel organized and trained.

The colleges or hospitals in this "gentlemen's agreement" will not be required to provide a formal organization, appoint officers nor agree to conduct training programs in order to be accepted in the plan. The modified affiliation plan, however, does not permit an officer to use it as a basis for military deferment if he should be called separately for active duty prior to the activation of the sponsored unit.

Distal Colon Stasis




# Management of Distal Colon Stasis with Metamucil®

The "irritable colon" resulting in distal colon stasis is a hard-to-manage by-product of many abdominal or stress conditions.

Roentgen evaluation of the commonly used methods to combat colonic stasis has shown the value of Metamucil because of its lack of irritation and its high degree of effectiveness* in this most prevalent type of stasis.

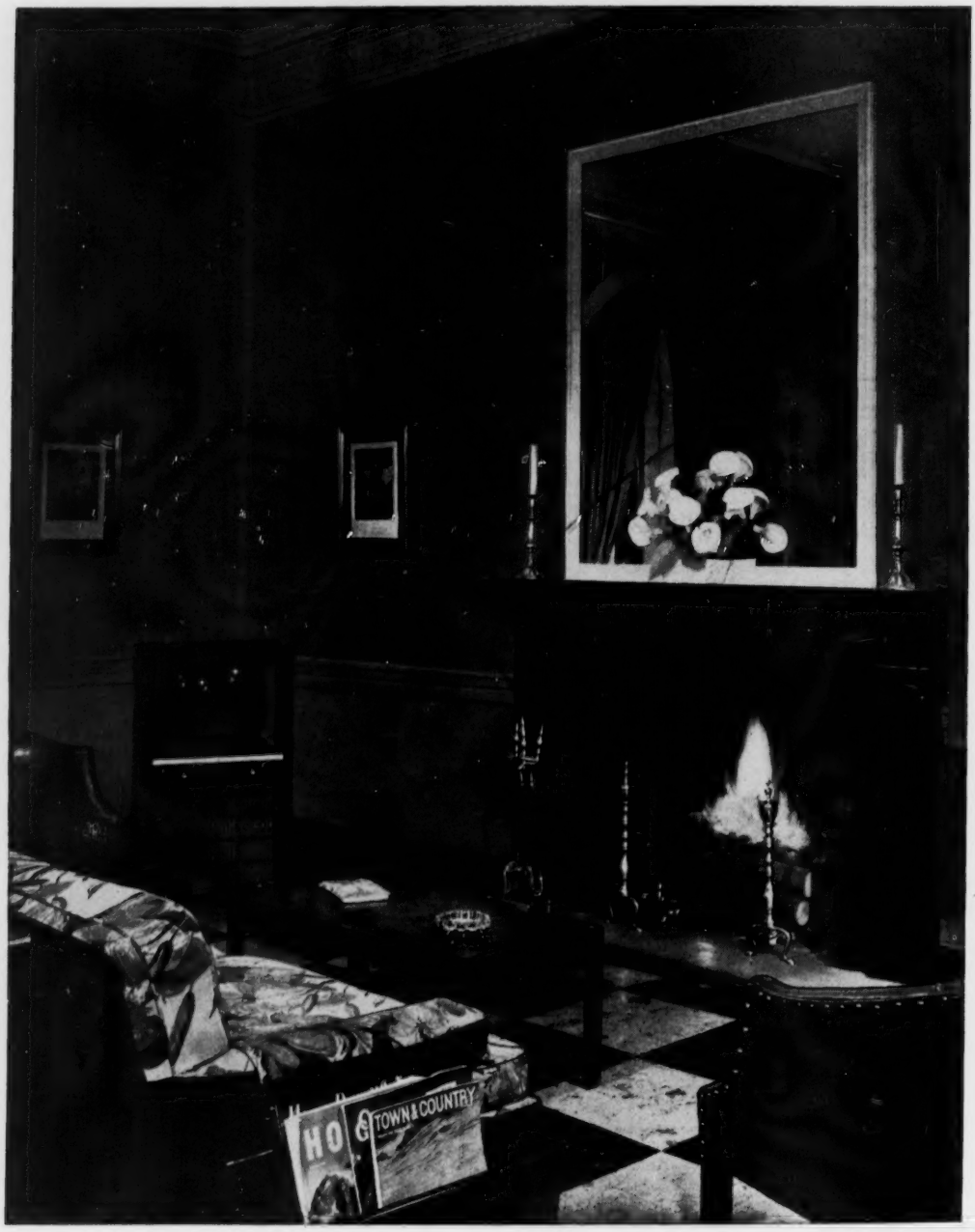
Metamucil is the highly refined mucilloid of Plantago ovata (50%), a seed of the psyllium group, combined with dextrose (50%) as a dispersing agent. It produces smooth fecal bulk necessary to incite the normal peristaltic reflexes, without causing irritation, straining, impaction or interference with the digestion or absorption of vitamins.

The average adult dose is one teaspoonful of Metamucil powder in a glass of cool water, milk or juice, followed by an additional glass of fluid if indicated. This amount of fluid is essential for the production of "smoothage."

It is supplied in containers of 4, 8 and 16 ounces. Metamucil is accepted by the Council on Pharmacy and Chemistry of the American Medical Association.

SEARLE *Research in the Service of Medicine*

*Barowsky, H.: A Roentgenographic Evaluation of the Common Measures Employed in the Treatment of Colonic Stasis. Rev. Gastroenterol. *19*:154 (Feb.) 1952.

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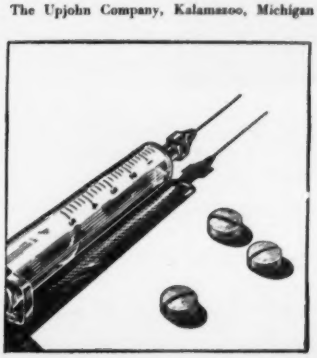

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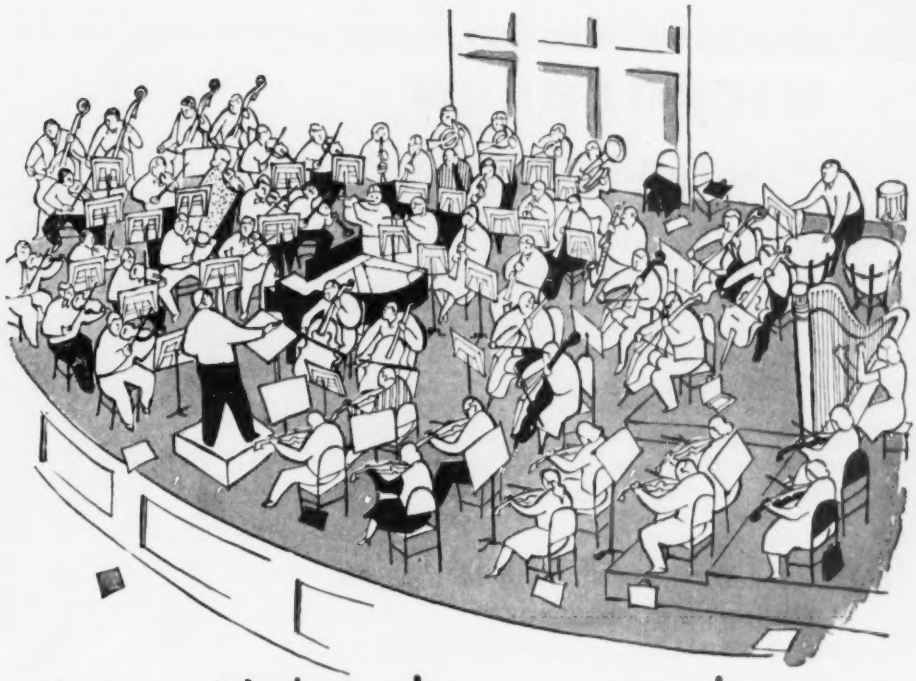

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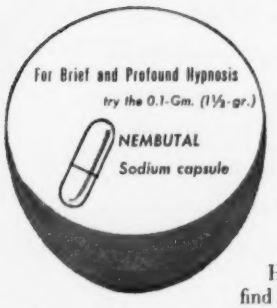


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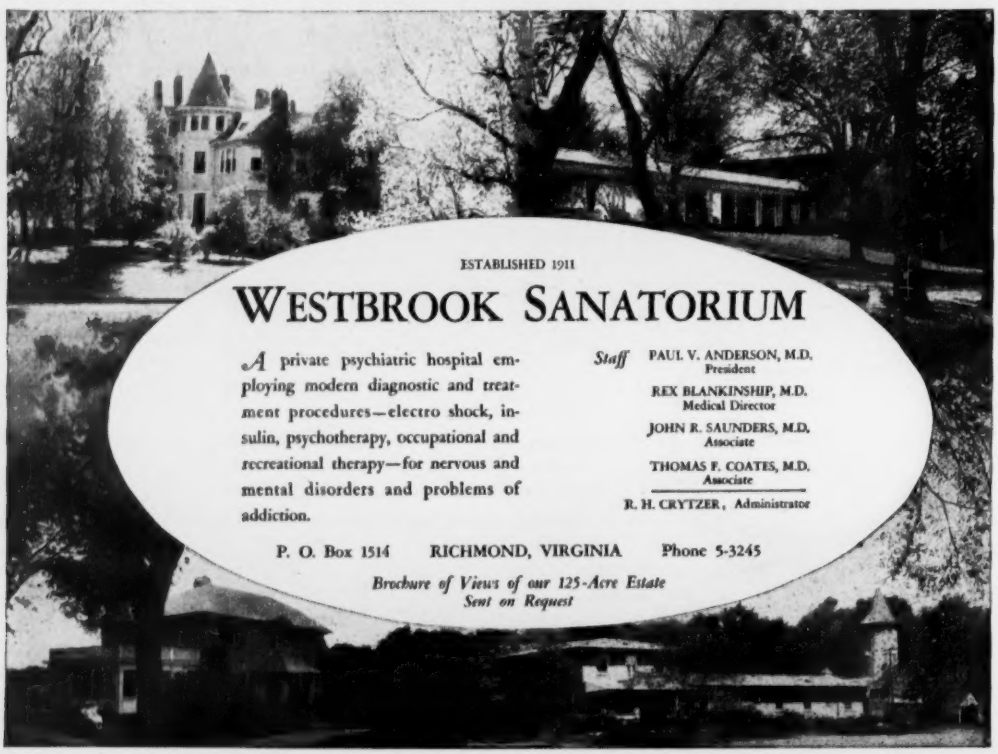

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1. Werner, A.: Acta endocrinol. *13*:87, 1953.
2. Malleson, J.: Lancet *2*:158 (July 25) 1953.
3. Goldzieher, M. A., and Goldzieher, J. W.: Endocrine Treatment in General Practice, New York, Springer Publishing Company, Inc., 1953, p. 23.

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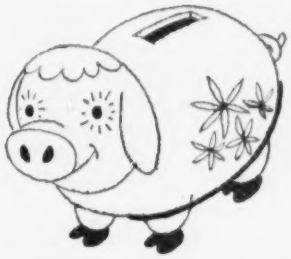

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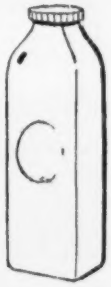

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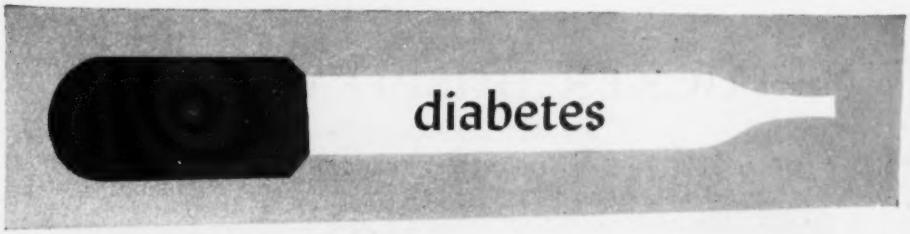


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1. Blotner, H., and Marble, A.: New England J. Med. *245*:567 (Oct. 11) 1951.
2. Steine, L.: GP *8*:45 (July) 1953.

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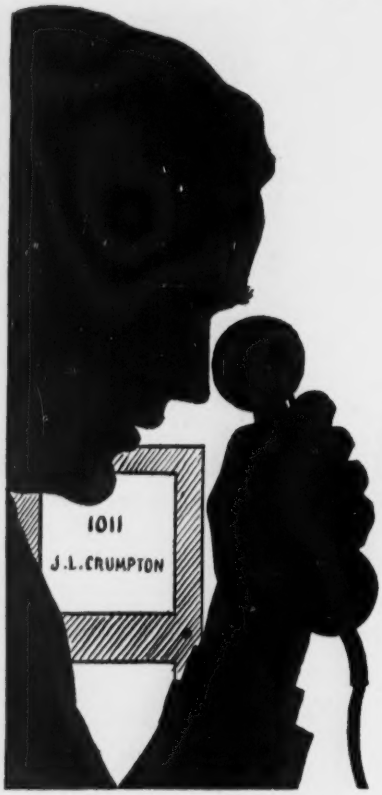


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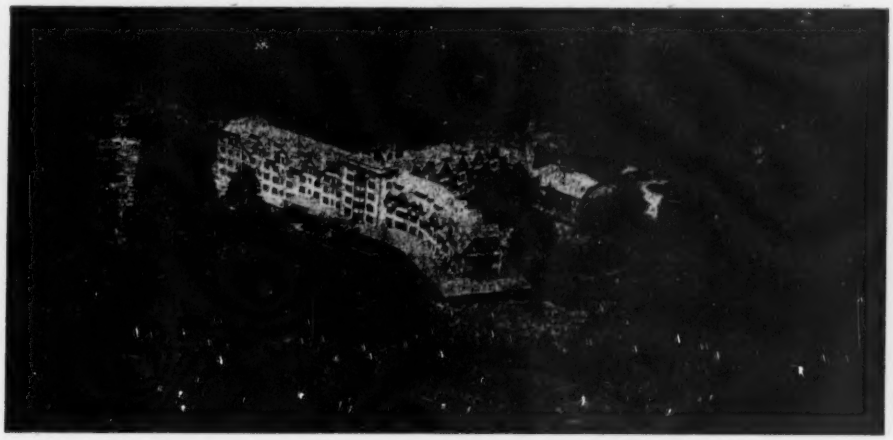

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